#1 Atari Computer Magazine

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Antic®

The ATARI® Resource

NOVEMBER 1984 VOLUME 3, NUMBER 7

Computer Adventures 1984

Sneak Previews
Infocom Secrets
Ultima IV . . . and More!

3 Adventure Programs

Advent X-5 by J.D. Casten
Omniventure
Adventure Island

How To:

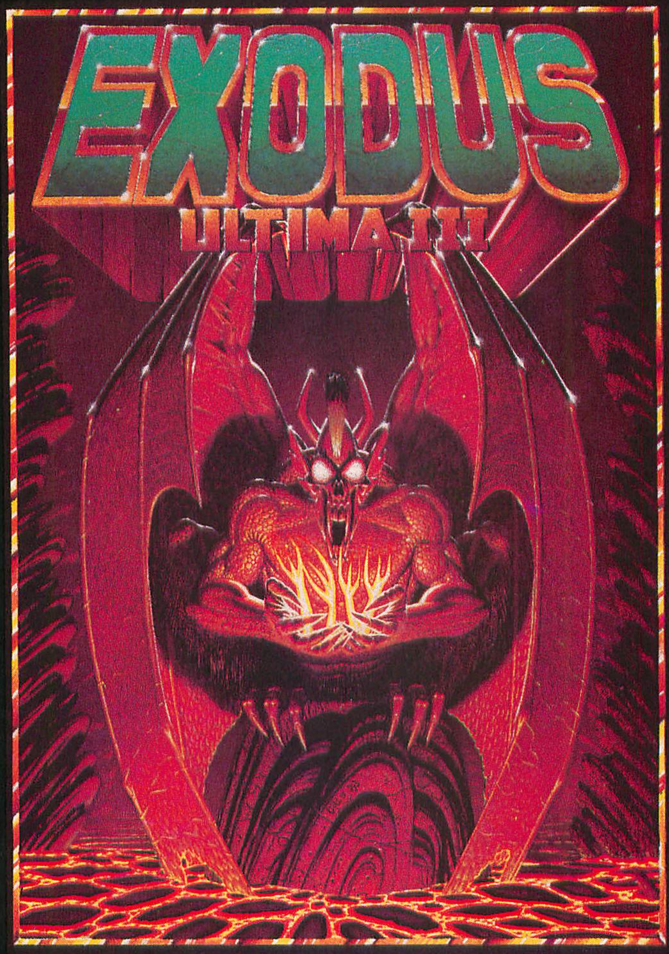
Personalize Your Cursor
Start Assembly Language
Make Windows Onscreen

FREE Inside:
10 Type-In Programs



11
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"A LIVING TAPESTRY . . ."



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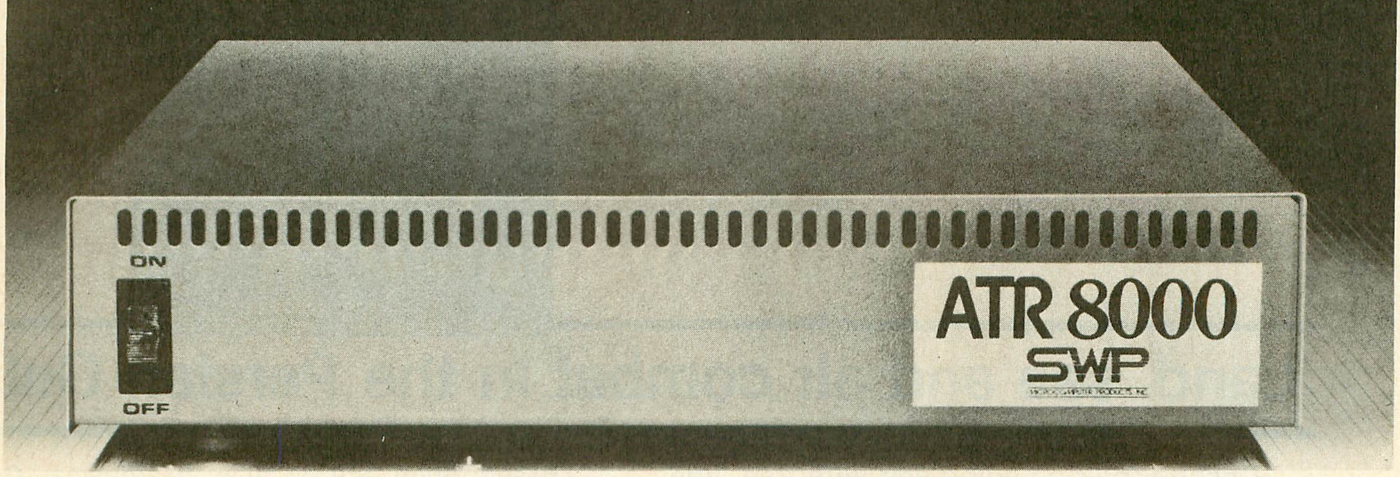
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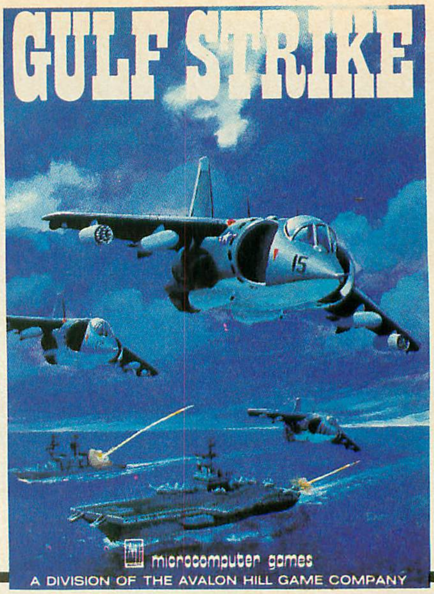
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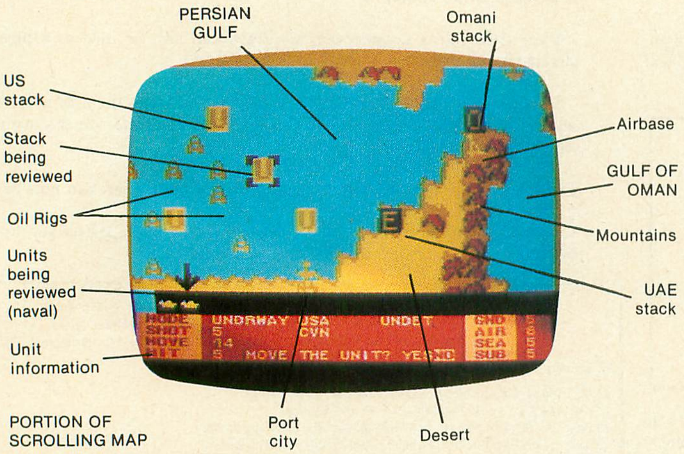
Oil tankers are sinking!

Where will it all lead?



Land, sea and air combat in the Persian Gulf

Despite their on-going war with Iraq, Iran began openly criticizing the Soviet presence in Afghanistan and the continuing war against their Islamic brethren. In addition to these verbal assaults, they openly supplied arms to the Afghan guerillas and allowed units to train in Iran, as well as establish bases for raids across the border.



The USSR began to republish the 1921 Treaty of Friendship agreement between themselves and Iran, especially noting Articles 5 and 6, which gave the USSR the right to intervene should a third party intrude militarily in Iran or use Iranian territory as a base for attacks on Soviet territory. On 6 June, 1985, the Soviet Union invoked the 1921 treaty, rolling across the border to terminate Iranian interference in Afghanistan.

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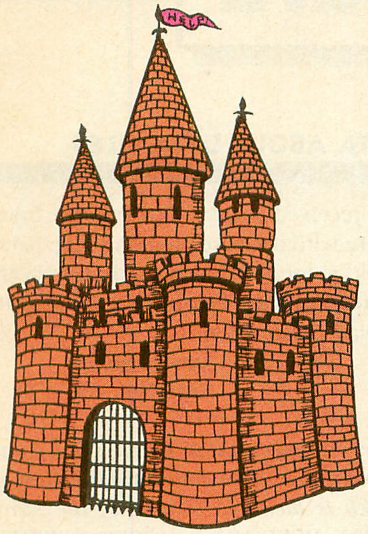
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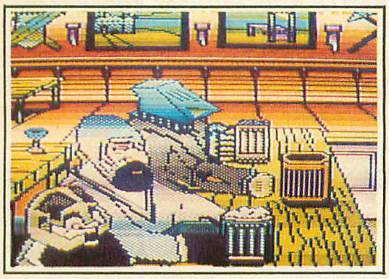
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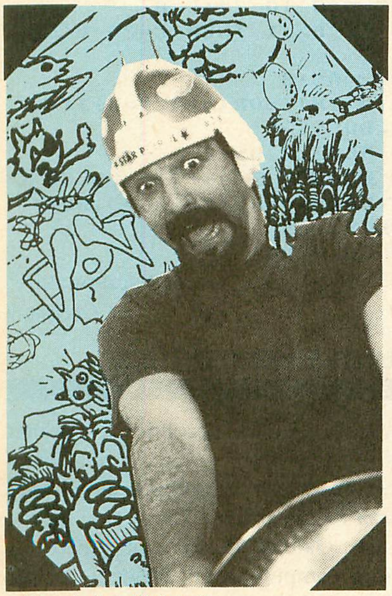
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i/o board

THE ANTICS OF SLYVESTER BIFFDROP

This amounts to a fan letter for J. D. Casten. Escape from Epsilon and Risky Rescue are exceptionally challenging! One of the difficulties with Escape is the game only utilizes the right and left positions of the joystick. If a diagonal is accidentally selected, Slyvester Biffdrop stops running and usually dies. A little change will keep him running if the joystick is pushed into the diagonal positions. Look at line 120 in the program. Replace the first part of the line, which reads IF ST=247 with IF ST>244 AND ST<248. (The rest of the line continues unchanged.

Similary, change line 125 from IF ST=251 to read IF ST>248 AND ST<252 (continue with the rest of line).

Frank Walters
Panama City, FL

SHOPPER'S FRIEND

Just a word or two about your magazine. I've subscribed for over a year, ever since I purchased my Atari. Without your help I would not have been able to put together the economical system that I have in my home, including the Atari 800, Gemini 10X, Ape-face, and the Indus disk drive.

Your reviews have allowed me to obtain the best buys on the market in hardware and software. In my area of Middle Georgia, there are no computer dealers where a hands-on test of products is possible, so it's vital that there is a reliable magazine such as **Antic** to give the low down on the latest software and hardware. Keep up the good work, and thank you.

Pete Miller
Warner Robins, GA

MAGNETIC ANTIC

Why don't you have your public domain software available on disk/cassette?

Tony Gray
Toronto, Canada

*We do! We have 14 disks and four cassette selections available, covering games, utilities, graphics and music. Also, each issue of **Antic** is now available prepackaged with a disk. For details, see the **Antic** Software Library page in this issue.* —ANTIC ED

DATA ABOUT DATA FILES

I've received a great deal of help from **Antic** with database programming. Now I'd like to use random-access data files with Microsoft BASIC, but I'm having trouble finding information.

Jerry Steinberg
Brooklyn, NY

*Atari Microsoft BASIC uses a NOTE command for random access, the function of which is identical to that of the Atari BASIC's NOTE. However, MSB uses PRINT AT instead of POINT. See the MSB manual's discussion of NOTE and AT, and Jerry White's article "Update Disks With NOTE and POINT," (**Antic**, April 1984). You'll have to revise Jerry's program somewhat to be compatible with MSB.* —ANTIC ED

GRAPHICS 9 DEMO

Greetings from Berlin! This short program is a demonstration of the Atari Graphics 9 mode.

```
10 GRAPHICS 9:SETCOLOR 4,1
,0:S=10
20 FOR AS=55 TO 0 STEP -S:
FOR B=0 TO 24:C=B
30 IF B>11 THEN C=24-B:C=C
+3
40 Z=AS+B
50 D=INT(SQR(B*(24-B)))/2:
COLOR 15-C
60 PLOT Z,AS+7-D
70 DRAWTO Z,AS+7+D:COLOR C
80 DRAWTO B,180-AS+3:NEXT
B:NEXT AS
90 GOTO 90
```

Oliver Baczkowski
Fed. Rep. of Germany

PRINTER PERPLEXITIES

I have an Okidata Microline 82-A printer with an Atari 800. I am unable to print inverse characters or dump graphics and charts to the printer. I was told by the former Okidata dealer that I had the wrong computer and "Welcome to the computer world." Is there any help for me, or do I need different equipment?

B.E. Kilgore
Santa Cruz, CA

Most dot-matrix printers require special software, such as Lister-Plus, Megafont, or PrintWiz to print hard copy of the

i/o board

Atari inverse and special characters because Atari provides more characters than other computers, not because you have the wrong computer.

According to Okidata, their Microline 82-A, as sold, does not come with the necessary graphics equipment for a special character or screen dump. For $49, however, you can purchase the Okigraph 1 from Okidata. This is a set of chips which, when plugged into your printer, will allow it to handle dot-addressable graphics. We were warned, however, that in the 82-A, unlike the Gemini 10X or Epson FX-80, the Least Significant Bit fires the top pin on the Okidata, whereas the Most Significant Bit does the same on the Gemini and Epson. Also, the printer codes are different, so you might want to contact the makers of the software mentioned above and hear what they have to say. —ANTIC ED

CASSETTE AUTO BOOT

I have an answer to Eddie Leach's problem in the September 1984 issue of **Antic**, "Cassette Auto Boot?" He needed a fully automatic boot capability for his 48K Atari 400 for an alarm system he was building.

Add these two lines to your program, and use a GOTO 32750 to boot your cassette.

```
32750 RESTORE 32760:CLR
32755 DIM X$(40):POKE 764,
32:FOR X=1 TO 19:READ Y:X$
(X,X)=CHR$(Y):NEXT X:X=USR
(ADR(X$))
32760 DATA 162,253,154,169
,183,72,169,84,72,169,4,32
,182,187,169,255,76,4,187
```

Brian Kummer
Cincinnati, OH

DOS AND ATARIWRITER

Here's a discovery for readers that have a disk drive with OSS DOS XL 2.2 or 2.3 and use Atariwriter. I've found that you cannot use this DOS with this word processor. To fix this incompability problem, delete the file called STARTUP.EXC.

Brant Sears
Sapulpa, OK

A BASIC DIRECTORY

I have used my Atari for four years and I've devised a simple way to get the directory from the disk in BASIC. Go to DOS and type

```
C [RETURN]
E:,D:DIR  [RETURN]

DIM N$(15):CLOSE #5:OPEN #
5,6,0,"D:*.*":FOR I=1 TO 6
4:INPUT #5,N$:? N$:NEXT I:
CLOSE #5  [RETURN]

[CTRL][3]
```

Then, in BASIC, type

ENTER "D:DIR"

This will also generate an Error 136, which can be ignored, and will give you the directory.

I'm sure a lot of your readers will like this very short but useful utility.

Kenny Ksajikian
Van Nuys, CA

BLINKING CURSORS

In the August I/O Board we printed a request for a blinking cursor routine ("Grab Bag"). Our thanks to everyone who contributed to the subsequent torrent of letters and routines. All but one of these manipulated address 755 which caused the cursor and all inverse characters to blink. The remaining program blinked only the cursor, but required several keystrokes before the blinking began. Please see Jerry White's "Create your own cursor" in this issue for a useful blinking cursor.

Another request sought a cursor redefined as an ATASCII number. Below is Alan Budelier's solution. —ANTIC ED

```
0 ASCII=42:REM ASCII CHARA
CTER '*'
10 DATA 165,107,240,3,76,9
8,228,165,84,201,24,208,3,
76,98,228,165,80,24,105,12
8,197,93,240,3,76,98,228
20 DATA 160,0,165,206,145,
94,76,98,228
30 FOR I=1536 TO 1572:READ
 A:POKE I,A:NEXT I:POKE 54
286,0:POKE 548,0:POKE 549,
6:POKE 54286,64
40 IF ASCII<32 THEN ASCII=
ASCII+64:GOTO 60
50 IF ASCII<96 AND ASCII>=
32 THEN ASCII=ASCII-32
60 POKE 206,ASCII
```

ACTION!

I've been programming with Action! for a few months now and wrote the following demonstration program, which shows the speed of the Action! language. This routine puts three thick bars on the screen. They will rotate upward in 128 unbroken colors while the background colors move down.

Try running this in a dark room for best results. This might be just the thing to show the kid down the street with his brand new Apple IIc. But don't forget to remind him that his jaw is on the floor.

```
PROC pretty()
   DEFINE key="Peek(764)<255"
   CARD sc
   BYTE wsync=$D40A,
        vertcnt=$D40B,
        color0=$D01A,
        color1=$D018,
        counter, chgcolor,
        upcolor, i, loop,
        downcolor
   Graphics(23)
   Poke(764,255)
   sc=PeekC(88)
   SetBlock(sc+75*40,40*20,255)
   SetBlock(sc+37*40,40*20,255)
   SetBlock(sc,40*20,255)
   DO
   FOR counter=1 to 9
      DO
      upcolor=chgcolor
      downcolor=chgcolor
         DO
         wsync=0
         color0=downcolor
         color1=upcolor
         upcolor==+1
         downcolor==-1
         UNTIL vertcnt&$80
         OD
      OD
   chgcolor==+1
   UNTIL key
   OD
RETURN
```

Brian Abbot
Coos Bay, OR

HANDICAPPED PROGRAMMERS

I'd appreciate any keyboard reprogramming suggestions to make it easier for one-handed persons to use the Atari 800 and 800XL. Specifically we'd like to simplify commands where two keys must be depressed at the same time—such as CONTROL and cursor keys.

A.B. Fox, Jr., Principal
Bad Kissingen
D.O.D. School

continued on next page

i/o board

COMPUTER BRAINWASHING?

This short program, called "brainwash," contains eight FOR/NEXT loops.

```
5 D=500:Q=100:E=10:P=100:R
=5
6 FOR S=0 TO 15
10 GRAPHICS 18:POSITION 7,
3:? #6;"PROJECT":POSITION
6,6:? #6;"BRAINWASH"
11 D=D-1:Q=Q+100:D=D-Q:E=E
-1:P=P-15:R=R-1
20 FOR ZZZ=0 TO D:NEXT ZZZ
:FOR A=0 TO E:POKE 710,RND
(0)*255:POKE 711,RND(0)*25
5:POKE 712,RND(0)*255
30 SOUND 0,10,10,8:FOR B=0
 TO P+5:NEXT B:SOUND 0,55,
10,12:FOR B=0 TO P+5:NEXT
B:NEXT A
33 FOR C=0 TO R
35 GRAPHICS 23:COLOR RND(0
)*3:PLOT 0,0:DRAWTO 156,0:
DRAWTO 156,94:DRAWTO 0,94:
DRAWTO 0,0:DRAWTO 156,94
40 DRAWTO 156,0:DRAWTO 0,9
4
45 FOR ZZZ=0 TO D:NEXT ZZZ
:NEXT C
50 NEXT S
100 SOUND 0,0,0,0:GRAPHICS
 18:POSITION 7,5:? #6;"WHO
A!!"
110 FOR G=0 TO 1000:NEXT G
```

Chris Bluethman
Perry, OK

FOR SIMPLICITY'S SAKE

I enjoyed Mr. Wilcox's article on Boolean logic (August 1984). The article suggests a problem that has bothered me for some time.

I have programmed computers and taught computing for over 20 years. I've noticed that too many programmers use their programs to satisfy the needs of their own egos and not the needs of the people that are intended to use the programs. They use their programs as a means of showing their skills of inventiveness instead of thorough thoughtfulness. Generally, the job does not get done in the simplest method.

Referring to the example near the end of "Logic According to Boole," Mr. Wilcox indicated that "the resulting code is more difficult to debug." He did not mention, however, that the enhanced code took 33 more bytes than the "IF . . . THEN" version nor that it took 16 jiffies (one jiffy is about one sixtieth of a second) to cycle through the six conditions as opposed to seven jiffies for the simpler, more understandable method.

As hobbyists or programmers, we must remember that in the long run the simplest programming methods will have the most staying power.

Gene Barton
Chatsworth, CA

BEST WISHES

How delighted we, of ROM Magazine, were to meet you and your staff. It was most kind of you to take the time from your obviously hectic C.E.S. schedule to stop at the ROM booth.

Bob and Peter hold the publication of **Antic** in such high esteem and believe me, your visit to ROM's booth was the highlight of their C.E.S. trip.

Mrs. T.G. Cockroft
General Manager,
ROM Magazine
Maple Ridge, Canada

*Thanks for the visit and the kind words. Best wishes from the **Antic** Staff.*

—ANTIC ED

COUNTING ON BANK STREET WRITER

I am a freelance writer using an Atari 800 and Bank Street Writer (Broderbund). How can I get a program to count words accurately? How much will it cost?

Cheryl Kennedy
North Little Rock, AR

As far as we know, there is no commercial word-count program for Bank Street Writer. However, we wrote a short, fairly accurate BASIC program to do this, and it won't cost you a cent. Replace SAMPLE in line 10 with the name of your text file.

```
10 OPEN #1,4,0,"D:SAMPLE"
20 TRAP 100
30 GET #1,B
40 IF B<>32 and B<>142 THEN 30
50 GET #1,B:IF B=32 OR B=155
   THEN 50
60 COUNT=COUNT + 1
70 GOTO 30
100 PRINT " Word Count = ";COUNT
```

—ANTIC ED

WHAT PRINTER?

I am planning to buy a printer, but have not found one that is XL compatible and usable with Atariwriter. It has to be tractor feed, letter quality and relatively sturdy. Any ideas?

M. Claudio
Queens, NY

Watch for our upcoming printer issue. There will find all of your questions about printers, compatibility, buffers and screen dump programs answered.

—ANTIC ED

PEN PALS

I would like to thank you for the International Issue in March. After reading your magazine I wrote to Emanuel Sellner of Austria featured in that last issue. Now he and I are pen-pals. Now we've traded lots of games with each other. I hope all readers can get to know each other.

Hubert Hom
San Francisco, CA

BLIND PROGRAMMER

After reading "Listening for Error Messages" in the I/O Board (**Antic**, August 1984), I decided to try to answer the request of a nameless programmer who is without sight. I admire the courage required to attempt using a computer without the aid of eyesight.

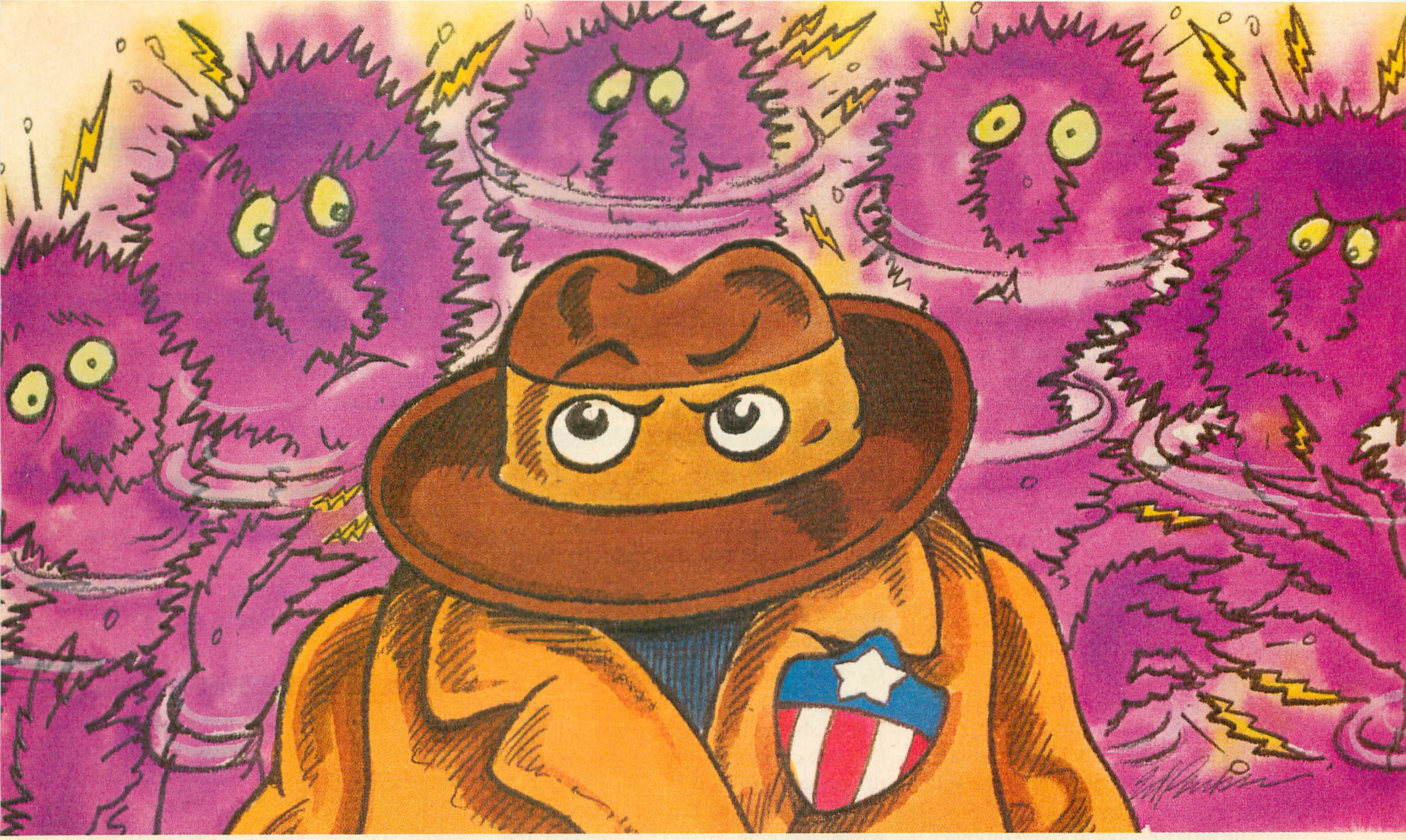
I've written a machine language routine that produces a steady beeping sound and monitors two key locations used by BASIC to handle errors—locations 166 and 185 (decimal). If an error occurs, the beeping lowers in tone. If the error takes place while a program is running, the tone is raised to its former pitch with one press of the combination of a shift key and the space bar, followed by [RETURN]. If the error occurs in the immediate mode, however, the previous combination must be entered twice to restore the pitch.

Fred Deutsch
Simi, CA

Thank you, Fred. We've passed your solution on to the person who requested it.

—ANTIC ED

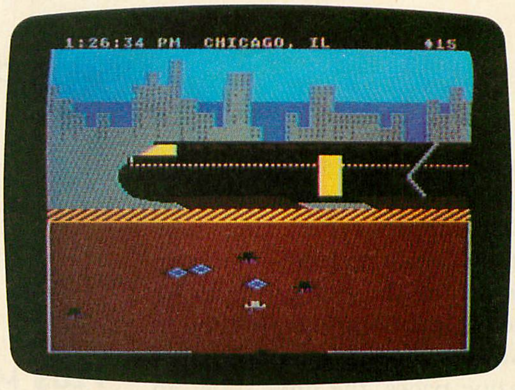
continued on page 10



Help Agent U.S.A. stop the fuzz plague. And you can win a trip to Washington, D.C.

The FuzzBomb is turning millions of men, women and children into mindless fuzzbodies. And Agent U.S.A. can't stop the devious plague spreader without your help.

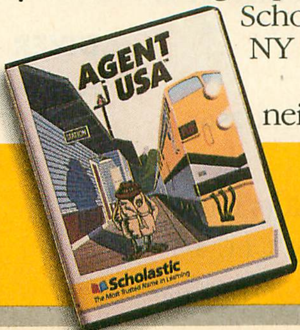
But don't accept the assignment unless you're really prepared to stretch your mind. Because sharp eyes and quick reflexes aren't enough to stop the fuzz plague. You'll have to outthink and outplan the FuzzBomb as you pursue him around the country in super-fast rocket trains. And you'll have to remember state capitals, learn the time zones and figure out the quickest routes across the nation. If you don't, the fuzzbodies will turn you into one of them.



Become one of the few super-agents to defeat the FuzzBomb and you may win a trip to intelligence headquarters in Washington, D.C. What's more, even if you never catch the evil one, tell us what you like about the game and you can become an instant winner of an Agent U.S.A. knapsack (see package for contest details).

Agent U.S.A. needs you now. So sign up where you usually buy your software. Or write to Scholastic Inc., Dept. EW, 730 Broadway, New York, NY 10003.

Do it before the fuzz plague comes to your neighborhood!



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help!

RECALL PROBLEMS

If you typed in "Recall" (**Antic**, August 1984, page 12), you're probably having trouble getting it to work. In order for the program to work correctly, the variable QQ$ in line 10000 must be the first variable entered in the program. Here's how to get the working version:

1. ENTER or LOAD the version of RECALL that you've typed in.
2. LIST "D:RECALL.LST" (Cassette users LIST "C:" onto another cassette). If you already have a LISTed version, you may omit this step.
3. Type NEW [RETURN].
4. Type DIM QQ$(1) [RETURN].
5. ENTER "D:RECALL.LST" (Cassette users rewind the cassette from step 2 and ENTER "C:").
6. The program now in your computer should work correctly. SAVE (don't LIST) a version for permanent storage.

If you haven't already typed the program in, simply type DIM QQ$(1) [RETURN] *first*, then enter the program.

SORRY, WRONG NUMBER

There was a typographic error in the September 1984 Communications Department article. The phone number for Cassie Stahl's bulletin board should be (408) 289-9151.

BUGS IN THE CAVERNS

Mr. Ramos's "Creepy Caverns" (**Antic**, August 1984) is a very imaginative game and he should be congratulated. I did run into two errors in the listing which caused the program to stop:

1. I often got an Error 3 at LINE 4105 when shooting arrows. I checked the values and found that T had a value of 2. Since LINE 10 set the maximum values of the two-dimensional array M0(1,5) and T is higher than 1, that caused the error. I changed the DIM value of M0 in LINE 10 to read M0(P,5).
2. Receiving an Error 9 at LINE 349 caused me to check LINE 349, where I found a zero instead of the letter O. The error no longer occurs when the line is changed from PEEK(1607+Y0) to PEEK 1607+YO).

Frank Walters
Panama City, FL

SHORTCUTS

There's an error in one of the listings for "Shortcuts to Success" (**Antic**, June 1984). In Listing 2 on page 89, line 490 should read:

```
490 CHACT = $02F3   ;CHAR. MODE
    REG
```

October Listing Errors

Missing division signs and lines

A number of division signs [/] were left out of listings in the October, 1984 **Antic**, due to typesetting telecommunications problems. (We again began setting the listings on an in-house dot matrix printer, starting in the November issue.) On the October magazine pages, the lines show an empty space where the missing division sign should appear.

Following are the lines where division signs are missing. We reprint here only the portions of the lines that surround the missing [/] characters.

MOLE ATTACK

Page 53 — line 20: POKE 756,S/256
Page 54 — line 1060: T=18–L/2
Page 55 — lines 1090 & 1110:
PEEK(20))/60)
line 1140: 756,S/256
line 1160:
IF AB/2<>INT(AB/2)
line 1170: AC=1 TO AB/2
line 1330: 756,S/256

PLUS MINUS

Page 56 — line 469:
SOUND 0,40,10,N/4
line 9020: CHBASE/256
Page 57 — line 10014: ( )*, . / :

BOUNCING BALL

Page 57 — line 110: INT(X/256)

ANTIC 4/5 ANIMATOR/EDITOR (5 listings)

Page 59 — line 84: A N T I C 4/5

Page 63 — In an unrelated error, the following two lines were left out of listing 3:

```
2820 FORJ=1 TO 10: FORI=0 TO 8
2822 K=USR(COPY,48,F(10+I),AW)
```

Page 66 — "HYPNO.BAS" line 210:
ADDRESS/256)
"HYPNO.BAS" line 220:
(BYTES/256)
"DEMO" line 10:
ERASE/PRINT

DIVER

Page 69 — line 550: #6;"/"
line 630: 0)*20)/(SK+1
line 650: *200)/(SK+1))
line 670: *15)/(SK+1)

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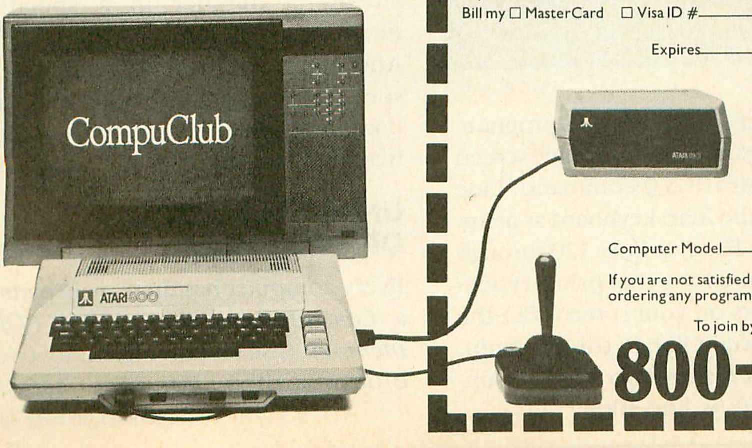
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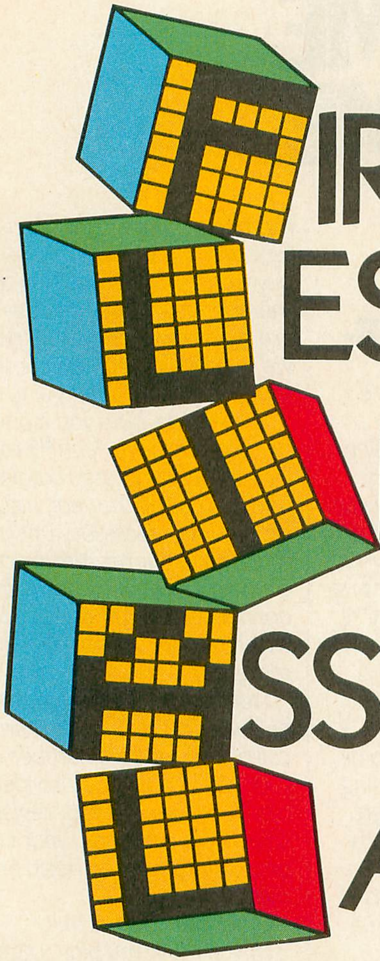
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FIRST LESSON IN ASSEMBLY LANGUAGE

Excerpt from *Atari Roots* — a terrific new book

by MARK ANDREWS

Start programming immediately in machine language! Turn on your Atari computer and type in this program. Then RUN it, type a few words, and you'll see something very interesting on your computer screen.

```
10 REM**"D:HEADSUP.BAS"**
20 REM**A MACHINE LANGUAGE
   PROGRAM**
30 REM**THAT YOU CAN RUN**
40 REM**STANDING ON YOUR
   HEAD**
50 REM
60 GRAPHICS 0:PRINT
100 POKE 775,4
110 OPEN #1,4,0,"K:"
120 GET #1,K
130 PRINT CHR$(K);
140 GOTO 120
```

This article is an excerpt from Atari Roots — A Guide to Atari Assembly Language. *Written by Mark Andrews and published by Datamost ($14.95), this new paperback book is an excellent introduction to Assembly Language programming for Atari computerists.*

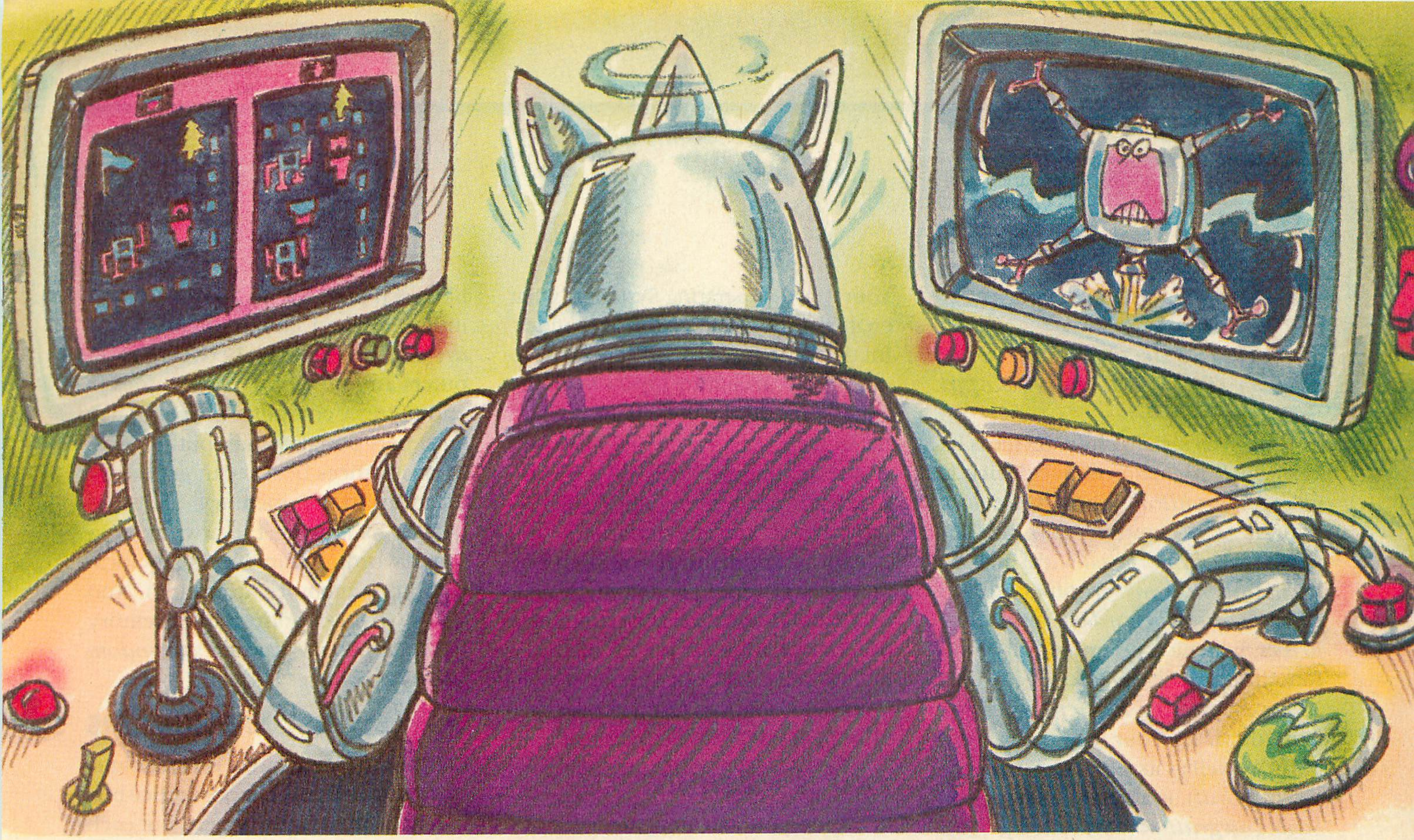
This is, of course, a BASIC program. Line 60 clears your computer screen with a GRAPHICS 0 command. Line 110 opens the Atari keyboard as an input device. Then, in lines 120 through 140, there is a loop that prints typed-in characters on your screen. But the most important line in this program, the line that makes it do what it's supposed to do, is line 100.

The active ingredient of line 100, the instruction POKE 755,4 is actually a machine language instruction. In fact, all POKE commands in BASIC are machine language instructions. When you use a POKE command in BASIC, what you're actually doing is storing a number in a specific memory location in your computer. And when you store a number in a specific memory location in your computer, what you're doing is using machine language.

UNDER THE HOOD OF YOUR ATARI

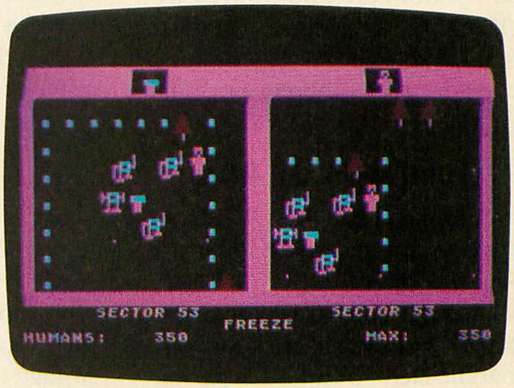
Every computer has three main parts: a *Central Processing Unit (CPU)*, *memory* (usually divided into two blocks called *Random Access*

continued on page 14



Show us the face of Max the Master Robot. And you may win your own talking robot.

Team up with a friend to defeat Max and his robot raiders in Bannercatch.
Only a handful of people have ever seen the face of the robot leader Max. Defeat Max and his demon robots and you'll join this elite group. And you and your teammate can win two walking, talking robots you can program yourself.



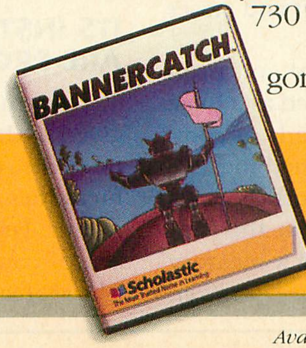
You'll battle Max and his robot marauders in a field bigger than any you've ever seen. Your team must invade robot territory and grab their flag before they take yours. But be careful; Max has devised a fiendish strategy against you. And, of course, you can't expect mercy from robots.

To make things even tougher, Max has taken a vow not to reveal his face until you conquer all his robots. Including Zweli the Invisible.

You'll need to learn binary numbers, map reading and, above all, how to work with your teammate if you want to win. But even if you go down to defeat, you may win two tickets to your favorite local sports event. See the package for contest details.

You can pick up Bannercatch where you buy software. Or write to Scholastic Inc., Dept. EW, 730 Broadway, New York, NY 10003.

But please remember, only a handful of people have gone face-to-face against Max and survived.



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FIRST LESSON IN ASSEMBLY LANGUAGE
continued from page 12

Memory (RAM) and Read Only Memory (ROM), and Input/Output (I/O) devices.

Your Atari's main input device is its *keyboard*. Its main output device is its *video monitor*. Other I/O devices that an Atari computer can be connected to (or *interfaced* with) include *telephone modems*, *graphics tablets*, *cassette data recorders*, and *disk drives*. In a microcomputer, all of the functions of a central processing unit are contained in a *MicroProcessor Unit* (or *MPU*). Your Atari computer's MPU, as well as its CPU (*Central Processing Unit*), is a circuit using *Large Scale Integration (LSI)* called a *6502 microprocessor*.

THE 6502 FAMILY

The 6502 microprocessor, your computer's command center, used not only in Atari computers, but also in personal computers manufactured by Apple, Commodore, and Ohio Scientific. That means, of course, that 6502 assembly language can also be used to program many different personal computers.

THE FOUNTAINS OF ROM

Your computer has two kinds of memory: Random Access Memory (RAM) and Read Only Memory (ROM). ROM is your Atari's long-term memory. It was installed in your computer at the factory, and it's as permanent as your keyboard. Your computer's ROM is permanently etched into a certain group of chips, so it never gets erased, even when the power is turned off. For most home computer owners, that's a good thing. Without its ROM, your Atari wouldn't be an Atari, In fact, it wouldn't be much more than an expensive, high tech doorstop.

The biggest block of memory in ROM is the block that holds your computer's *Operating System*, or *OS*. Your Atari's Operating System is what enables it to do all of those wonderful things that Ataris are supposed to do, such as accepting inputs from the keyboard, displaying characters on the screen, and so on. ROM is also what enables your computer to communicate with peripherals such as disk drives, cassette recorders, and telephone modems. If you own one of Atari's XL series of computers, your unit's ROM package also contains a number of added features, such as a built-in self-diagnostic system, a built-in foreign language character set, and built-in BASIC.

RAM IS FLEETING

ROM, as you can imagine, was not built in a day. Your Atari's ROM package is the result of a lot of work by a lot of assembly language programmers. RAM, on the other hand, can be written by anybody — even you. RAM is your computer's main memory. It has a lot more memory cells than ROM does, but RAM, unlike ROM, is fleeting. The trouble with RAM is that it's erasable, or, as a computer engineer might put it, *volatile*.

When you turn your computer on, the block or memory inside it that's reserved for RAM is as empty as a blank sheet of paper. And when you turn your computer off, anything you may have in RAM disappears. That's why most computer programs have to be loaded into RAM from mass storage devices such as cassette data recorders and disk drives. After you've written a program, you have to store it somewhere so it won't be erased when the power goes off and erases your RAM.

Your computer's RAM, or main memory, can be visualized as a huge grid made up of thousands of compartments, or cells, something like tiers upon tiers of post office boxes along a wall. Each cell in this vast memory matrix is called a memory location, and each *memory location*, like each box in a post office, has an individual and unique *memory address*. The analogy between computers and post office boxes doesn't end there. A computer program, like an expert postal worker putting mail in post offices boxes, can get to any location in its memory about as quickly as it can get to any other. In other words, it can access any location in its memory at random. And that's why user-addressable memory in a computer is known as *random access memory*.

ITS "LETTERS" ARE NUMBERS

Our post office analogy isn't absolutely perfect, however. A post office box can be stuffed full of letters, but each memory location in a computer's memory can hold only *one number*. And that number can represent only *one of three things*:

1. The stored number itself.
2. A code representing a typed character.
3. A machine language instruction.

WHAT NEXT?

When a computer goes to a memory location and finds a number, it must be told what to do with the number it finds. If the number equates to just a number, then the computer must be told why the number is there. If the number is a code representing a typed character, then the computer must be told how the character is to be used. And if the number is to be interpreted as a machine language instruction, the computer must be told that, too.

ITS INSTRUCTIONS ARE PROGRAMS

The instructions that computers are given so that they can find and interpret the numbers stored in their memories are called *computer programs*. People who write programs are, of course, called *programmers*. The languages that programs are writ-

ten in are called *programming languages*. Of all the programming languages assembly language is the most comprehensive.

RUNNING A MACHINE LANGUAGE PROGRAM

When your computer runs a program, the first thing it has to be told is where the program has been stored in its memory. Once it has that information, it can go to the memory address where the program begins and take a look at what's there. If the computer finds an instruction that it's programmed to understand, then it will carry out that instruction. The computer will then move on to the next address in its memory. After it follows the instruction it finds there, it will move on to the next address, and so on.

The computer will repeat this process of carrying out an instruction and moving on to the next one until it reaches the end of whatever program has been stored in its memory. Then, unless it encounters an instruction to return to an address within the program or to jump to a new address, it will simply sit there, patiently waiting to receive another instruction.

COMPUTER LANGUAGES

As you know, programs can be written in dozens of computer languages such as BASIC, COBOL, Pascal, Logo, and so on. Languages like these are called *high level languages*, not because they're particularly esoteric or profound, but because they're written at too high a level for a computer to understand. A computer can actually understand only one language, *machine language*, which is written entirely in numbers. So before a computer can run a program written in a high level language, the program must somehow be translated into machine language.

Programs written in high level

continued on next page

languages are usually translated into machine language using software packages called *interpreters* or *compilers*. An interpreter is a piece of software that can convert a program into machine language *as* it is being written.

A compiler converts high level languages into machine language *after* they are written. COBOL, Pascal and other high level languages are usually translated into machine language with compilers.

MACHINE LANGUAGE ASSEMBLERS

Interpreters and compilers are not used in writing assembly language programs. Assembly language programs are almost always written with the aid of software packages called *assemblers*. A number of assemblers for Atari computers are available, including OSS's very advanced MAC/65. An assembler doesn't work like an interpreter, or like a compiler. That's because assembly language is not a high level language.

One could say, in fact, that assembly language is not really a programming language at all. Actually, assembly language is nothing more than a *notation system* used for writing machine language programs using alphabetical symbols that human programmers can understand.

What we're trying to get across here is the fact that assembly language is totally different from every other programming language. When a high level language is translated into machine language by an interpreter or a compiler, one instruction in the original programming language can easily equate to dozens — sometimes even hundreds — of machine language instructions. When you write a program in assembly language, however, *every assembly language instruction that you use equates to just one machine language instruction with exactly the same meaning*. In other words, *there is an exact one-to-one relationship between assembly language instructions and machine language instructions.*

THE PROGRAMMER'S PLIGHT

Ironically, even though assembly language programs run much faster than programs written in high level languages, they require many more instructions and take much longer to write. One widely quoted estimate is that it takes an expert programmer about ten times as long to write an assembly language program than it would take him (or her) to write the same program in a high level language such as BASIC, COBOL, or Pascal.

On the other hand, assembly language programs run 10 to 1000 faster than BASIC programs, and can do things that BASIC programs can't do at any speed. So if you want to become an expert programmer, you really have no choice but to learn assembly language.

HOW MACHINE LANGUAGE WORKS

Machine language, like every other computer language, is made up of *instructions*. As we have pointed out, however, every instruction used in machine language is a number. The numbers that computers understand are not the kind that we're accustomed to using. Computers think in *binary numbers* — numbers that are nothing but strings of ones and zeros. Here, for example, is part of an actual computer program written in binary numbers (the kind of numbers that a computer understands):

```
00011000
11011000
10101001
00000010
01101001
00000010
10000101
11001011
01100000
```

It doesn't take much imagination to see that you'd be in for quite a struggle if you had to write long programs, which typically contain thousands of instructions, in binary style machine language. With an assembler, however, the job of writing a machine language program is considerably easier. Here, for example, is the above program as it would appear if you wrote it in assembly language:

```
CLC
CLD
LDA
#02
ADC
#02
STA
$CB
RTS
```

You may not understand all of that, but you'll have to admit that it at least *looks* more comprehensible. What this program does, by the way, is add 2 and 2. Then it stores the result of its calculation in a certain memory location in your computer — specifically, memory address 203.

ASSEMBLY LANGUAGE AND BASIC COMPARED

Assembly language is written using three-letter instructions called *mnemonics*. Some mnemonics are quite similar to BASIC instructions. One assembly language instruction that's much like a BASIC instruction is RTS, the last instruction in the sample routine we just looked at. RTS (written 0110 0000 in machine language) means "ReTurn from Subroutine." It's used much like the RETURN instructions in BASIC. There's also an assembly language mnemonic that's similar to BASIC's GOSUB instruction. It's written JSR, and means to "Jump to SuBroutine." Its equivalent in binary coded machine language is 0010 0000.

continued on page 18


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FIRST LESSON IN ASSEMBLY LANGUAGE
continued from page 16

Not all assembly language instructions bear such a close resemblance to BASIC instructions, however, An assembly language instruction never tells a computer to do something as complex as draw a line or print a letter on a screen, for example. Instead, most assembly language mnemonics instruct computers to carry out very elementary tasks such as adding two numbers, comparing two pieces of data, or (as we have seen) jumping to a subroutine. That's why it often takes vast numbers of assembly language instructions to equal just one or two words in a high level language.

SOURCE CODE AND OBJECT CODE

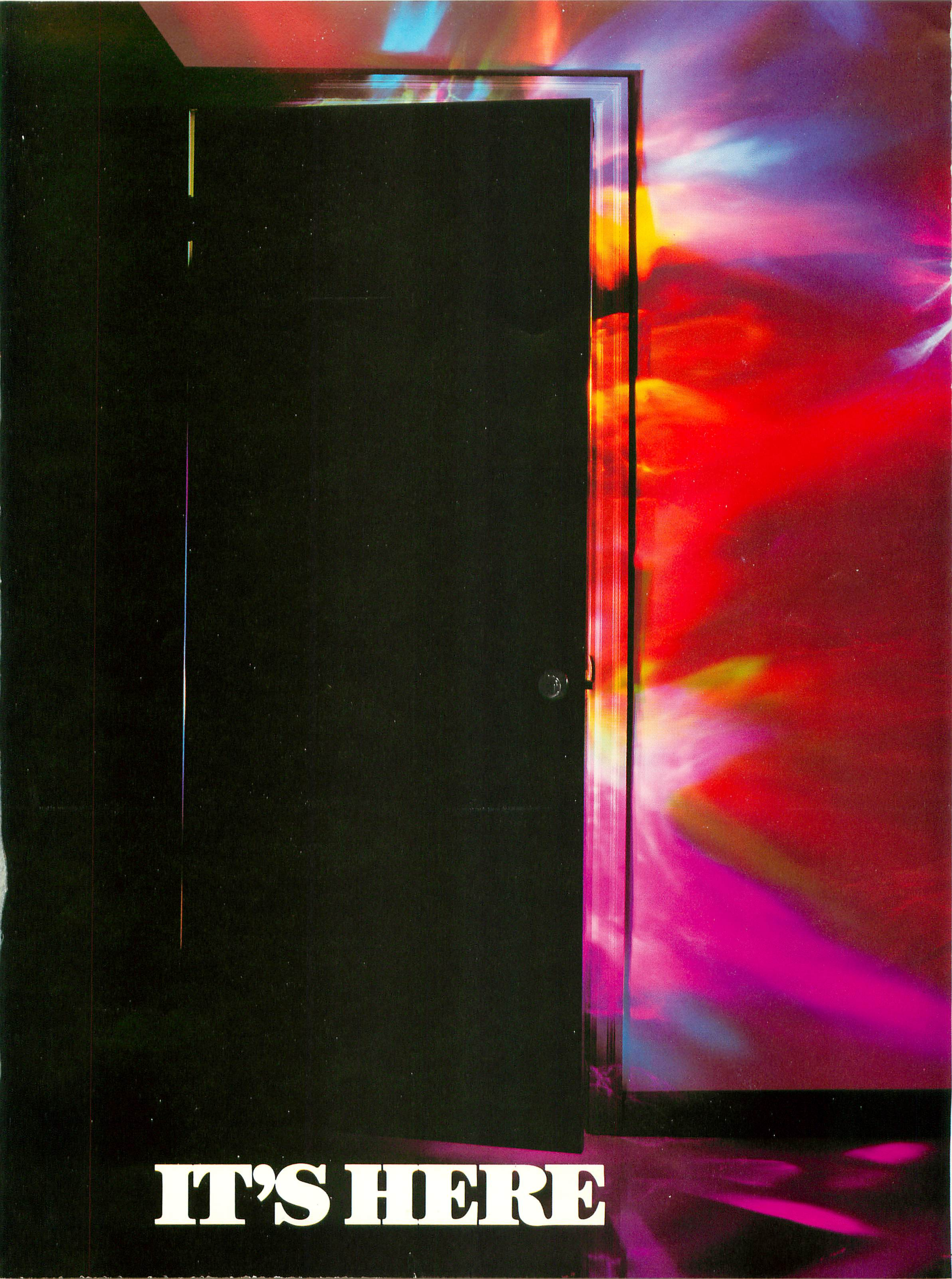
When you write an assembly language program, the listing that you produce is called *source code*, since it's the source from which a machine language program will be produced. Once you've written an assembly language program in source code, you can run it through an assembler. The assembler will then convert it into *object code*, which is just another name for a machine language program produced by an assembler.

THE SPEED AND EFFICIENCY OF MACHINE LANGUAGE

Since assembly language instructions are so specific (you might even say primitive) it obviously takes lots of them to make up a complete program; many, many more instructions than it would take to write the same program in a high level language. Ironically, machine language programs still take up less memory space than programs written in high level languages do.

That's because when a program written in a high level language is interpreted or compiled into machine language, big blocks of machine code must be repeated every time they are used. But in a well-written assembly language program, a routine that's used over and over can be written just once, and then addressed as many times as needed with JSR, RTS, and similar commands. Many other kinds of techniques can also be used to conserve memory in assembly language programs.

Mark Andrews writes a syndicated column about computers. Atari Roots *is his 11th computer book. He owns five home computer systems and the Atari is his favorite.*


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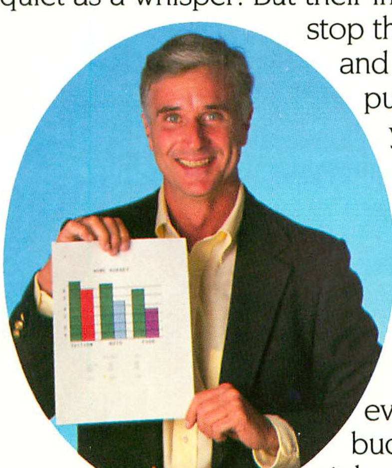
If you use your personal computer to keep track of mortgage payments, tuition payments, balance your checkbook or jump ahead of the Dow Jones', there's good news for you. You'll find that the new OKIMATE 10 gets down to business quickly. And easily.

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And while your imagination is soaring, you'll be glad to know that your new printer can keep right up with it! The new OKIMATE 10 is built with the same tradition of quality and manufacturing excellence that has made Okidata the most respected name in computer printers. Okidata craftsmen specially designed and engineered the new OKIMATE 10 to be incredibly small and lightweight. And they made it quiet as a whisper. But their imagination didn't stop there. To help you and your personal computer keep within your personal budget, they made the OKIMATE 10 available at retailers everywhere for less than $250. Something that should make every personal budget tickled pink.



Color your world.

If you've been playing games on your personal computer, now you can get serious and still have fun. The new OKIMATE 10 is completely compatible with a variety of software packages that will run on your Atari and Commodore with a simple disk drive. Just load and you're off and running. Plotting charts. Designing special graphs. Creating original illustrations and pictures. Drawing special graphics. And printing them all beautifully for everyone. On most kinds of paper. In over 26 beautiful colors!





QUESTIONS & ANSWERS

Q: Why do I need a printer?

A: You might as well ask, "Why do I need crayons?" When it comes to communicating, "putting it on paper" is still the best way to get your message across. You can have lots of computer equipment, but without the OKIMATE 10, it doesn't mean very much. Unless you get your letter, report, term paper or party invitation off the screen and down on paper, nobody's going to see it.

Q: What makes the OKIMATE 10 better than any other printer?

A: Because the OKIMATE 10 is unlike any other printer. First, it prints in COLOR. Up to 26 beautiful colors. Second, it prints up to 240 words a minute, so quietly you can talk in a whisper right next to it and still hear every word! And third, it prints letter quality, every time.

Q: What about graphics and pictures?

A: The OKIMATE 10 does it all. Graphs, charts, symbols, pictures, illustrations, and special drawings! With a compatible drawing package, anything you create on your screen can be printed in full color; a disk drive is required for color screen printing.





Q: What kind of paper can I use?

A: Just about any kind of smooth paper you want. From continuous feed computer paper to single sheets. From mailing labels to plastic acetate for overhead transparencies, the OKIMATE 10 prints crisp, clean, colorful images you'll be proud to send to friends, teachers, business associates, or frame and hang right in your own living room!



Q: Is the OKIMATE 10 easy to use?

A: As easy as "PLUG 'N PRINT!" No other printer is easier to use than the OKIMATE 10. Connecting the printer to your Commodore or Atari computer is, literally, a snap. The exclusive PLUG 'N PRINT package snaps into the printer. One cable connects it directly to your computer or disk/tape drive. Turn it on and you're in business. Once your OKIMATE 10 is up and running, the "Learn-to-Print" software program (included) teaches you printer basics—the "Color Screen Print" disk (also included) automatically prints everything on the screen in a single stroke. As a matter of fact, most of your printing can be done with just one command.

Q: What's the printer like in operation?

A: In one word: easy! Incredibly easy! The ribbon comes in a "Clean Hands" cartridge. So it's as easy to change as the tape in your audio cassette player.



Q: What about reliability?

A: Okidata has built the reputation of its complete line of printers on quality, dependability and rugged construction. The OKIMATE 10 is no exception. Don't let its light weight and compact size fool you. This printer is not a toy. It's a workhorse.

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ADVENTURES ON-LINE

Meet friends in a dungeon!

by MICHAEL CIRAOLO
Antic Staff Writer

Playing mainframe computer games is one of the most popular pastimes on the major on-line computer information services. It's surprisingly popular, when you consider how much cheaper it would be to buy one of the many similar adventures available on disk.

"It can be extraordinarily expensive to play adventures by the minute," freely admits The Source's public relations manager, Nancy Beckman. "It's not just students on their dad's accounts who are playing. There's a cross section of all types of business people sneaking off during the day to play on-line adventure games."

The lure of on-line gaming is easier to understand when you look at its two unique features—multiplayer capability and instant feedback.

MULTIPLAYER FEEDBACK

Multiplayer adventures like CompuServe's MegaWars (space battle a la Star Trek) and Plato's Moria (Dungeons & Dragons fantasy role-playing) can be used by up to 100 players at the same time. You find yourself adventuring along with students, lawyers or corporate vice presidents from places as far apart as Anchorage, Silicon Valley, Boston and New Orleans.

The other unique feature of on-line gaming is its capability for immediate communication with other players around the country, says Pat Phelps, manager of CompuServe's CB network. While playing, without interrupting a game, any player can switch into conversation with teammate or opponent. Terminal talking ranges from cursing the enemy to pleas for help from allies.

This interaction continues outside game time on the CompuServe Multiplayer SIG (Special Interest Group), Plato's notesfiles, or The Source's bulletin boards. These electronic forums are always available to provide opportunities for gamesters to compare notes, exchange tips, or just chat.

CompuServe's main multiplayer games are MegaWars II and MegaWars III. Using color graphics and sound on compatible terminals, MegaWars II is designed for two teams of up to four players each. The object of the game is to destroy all four enemy ships while capturing as many enemy and neutral planets as possible. You enter the game as a cadet, and attempt to work your way up through the ranks to admiral. MegaWars III is similar, except that up to 100 players can participate in one game simultaneously.

Plato's multiplayer games include Empire, their team-oriented space combat in the MegaWars mode, SeaWar, a grid boardgame simulation, and two fantasy role-playing adventures, Moria and Drygulch. All major Plato multiplayer games are supported by notesfiles (bulletin boards).

MORIA AND DRYGULCH

In Moria, as you explore the dungeon you can join with teams of players—frequently more experienced—or continue to risk wandering on your own. The screen shows you a detailed line drawing view of the scene ahead of you, including monsters, doors and corridor walls, along with status charts for your character's current strength and powers.

Plato's Drygulch is set in an Old West town. You are a miner trying to live long and prosper, which is not easy when hazards abound in the mines and in the wastelands surrounding the town. You must eat and drink enough to keep healthy, make sure you have enough prospecting equipment, etc. There are elections for sheriff, mayor and mine inspector. Each position offers potential for added fun and profit, election usually requires 10 to 12 votes.

In addition to multiplayer games, all three services offer a selection of the classic computer adventure games. These include versions of Hammurabi, a game that lets you govern ancient Sumeria. Avoid famine by paying attention to grain planting and harvests, taxes, birthrate, and so on. You can also expect to find Lunar Lander simulations, the original Trek space war and the original Colossal Cave text adventure.

continued on next page

MORE DUNGEONS

Also available on each service are single-player dungeon games like CompuServe's Castle Telengard and the Dungeons of Kesmai, The Source's Blackdragon, and Plato's Labyrinth. All allow you the usual role-playing choices in establishing your character's attributes, such as race, intelligence, dexterity and charisma. Typically, you equip your character with spells and weapons, and then venture down into the dungeons in search of monsters and treasure. Games on CompuServe and The Source provide rudimentary graphics (keyboard symbols like +, *, /, and —) in a top-down map overview. Plato offers more sophisticated graphics for an eyewitness viewpoint. On The Source, you'll find Castlequest and Explore. Both are well-written text adventures for players with prior experience in this genre. Because they are not renditions of previous works, they are sources of new challenge. They are also easier to read than the text on CompuServe, which uses a very slow mainframe computer that pauses several times on each screen of text during peak usage times (late afternoon to late evening).

SHORTCUT COMMANDS

Getting to adventure games in the three major on-line systems is not hard.

CompuServe has direct access page addresses for games including: GO GAM-200 for the original adventure, GO GAM-201 for the new adventure, GO GAM-219 for The House of Banshi, GO GAM-217 for the Scott Adams games, GO GAM-260 for the Dungeons of Kesmai, GO GAM-320 for Castle Telengard, GO GAM-305 for MegaWars II, GO GAM-105 for MegaWars III, and GO GAM-300 for the multiplayer game SIG.

To access games in The Source, type HELP GAMES at the command level to get an on-line listing.

In Plato, select the main menu option to run Plato programs. Then type in the game's name (drygulch, labyrinth). Some game files require a zero in front of the name (0empire, 0moria). Notesfiles include morian (for Moria), gulchnts (for Drygulch), and empnotes (for Empire). The original adventure game can be accessed by typing rezadv1. Using the Plato index, you can get a list of all games.

Bulletin Board Update

(All times are local standard times for the particular board)

Arizona

Amis Outpost, 24 hours	(602) 578-0784
Twilight Zone, 24 hours	(602) 790-8805

California

Compucat, 6 p.m.–9 a.m., M–F	(408) 353-1836
Hermit, 24 hours	(707) 428-3077
Wizardry, 24 hours	(818) 346-4343
Interact-Sylmar	(818) 367-0324
Interact-Van Nuys	(818) 902-1477
S.F. Valley Green Machine	(818) 368-1661
S.F. Valley RBBS	(818) 368-5801
Granada Hills Energy Group	(818) 360-5053
Starship Atari, 24 hours	(415) 387-2190
Rat's Nest	(408) 249-6946
Dark Tower	(408) 248-5135
Moonbeam	(408) 773-9326
GGBBS	(415) 282-6138

Canada

Castle Greyhawk, Evenings	(514) 325-4310

Florida

Star Raiders	(305) 226-1452
Swap Shop, 24 hours	(305) 878-1422
Software Library	(305) 845-6466
Jax Forem	(904) 733-4515
Beach Forem	(904) 246-8133

Indiana

AMIS Bulletin Board	(219) 824-5198

Illinois

Electric Co.	(312) 221-0171
Ray's Outer Limits	(312) 933-1071

Maryland

Forem Hotline	(703) 683-3944
Rickey Moose	(301) 474-7591

Michigan

MACE Main	(313) 978-1685
MACE West	(313) 582-0657
MACE Trading Post	(313) 882-5909
MACE Ethernet	(313) 531-1701

(all four are 24 hours)

New Jersey

Enterprise BBS	(201) 689-0492
Gemini After Dark, 6 p.m. to 9 a.m., all day Sunday	(201) 267-0988
JACG BBS, 24 hours	(201) 549-7591

New York

Colossal Caves, 24 hours	(516) 673-3141
Metal Board I	(516) 742-5949
Metal Board II	(516) 944-3116
Starship Atari	(516) 626-6990

Rhode Island

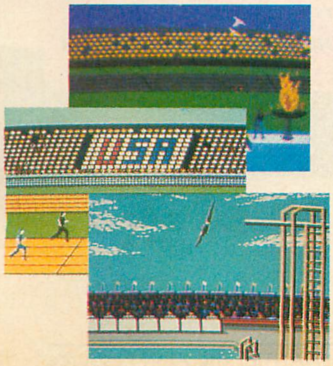
AARI BBS	(401) 521-4234

Texas

The Midnight Turtle	(214) 783-7548

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So change into your running shoes, grab your joystick and **GO FOR THE GOLD!**

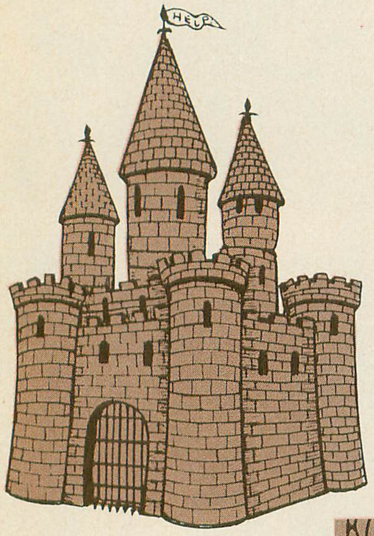
One or more players; joystick controlled.

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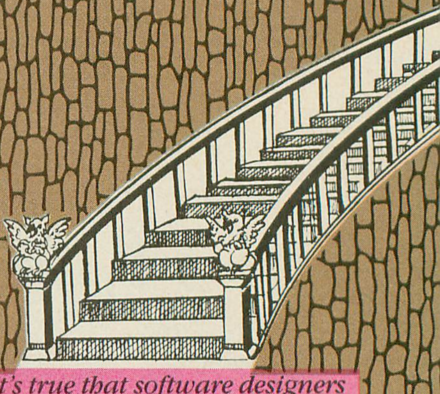
ADVENTUR



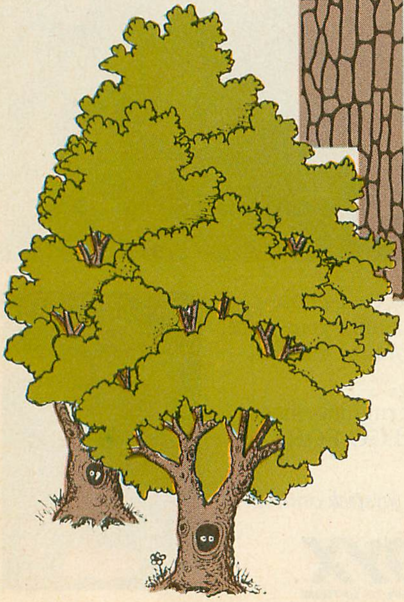
You started out by blasting endless attack waves of zombie-like space attackers. Then you mapped your way through a colossal cave and fought trolls in the great underground empire of Zork. You carefully adjusted fuel rates to land yourself on the moon.

Your taste in mind-challenging computer recreation is a lot more sophisticated now. You demand innovation from the marketplace.



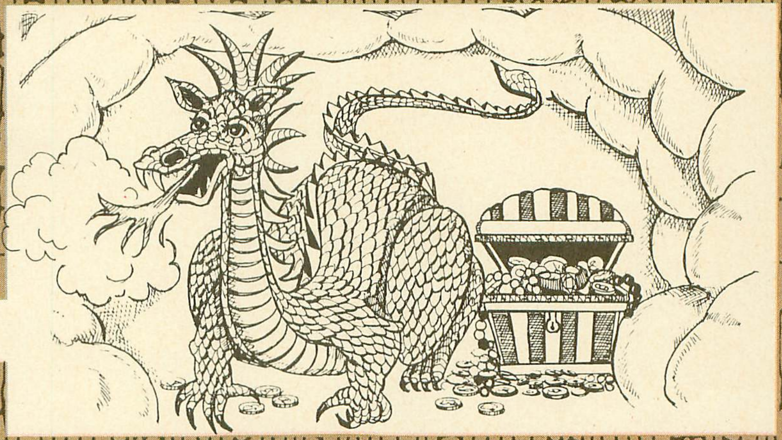


It's true that software designers still haven't come up with a totally new kind of adventure game to stand alongside the established standard formats such as—all-text puzzle explorations, visuals plus text, graphic scrolling displays, fantasy role-playing (computerized dungeons & dragons), space wars . . . even simulations and computerized strategy board games.

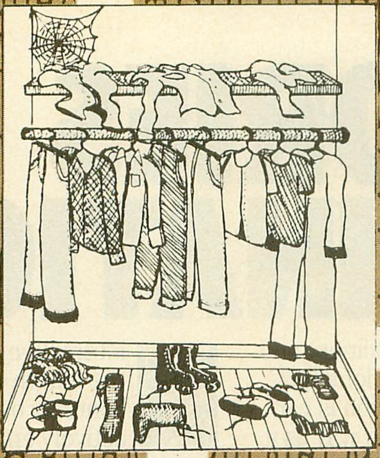


E TRENDS

by MICHAEL CIRAOLO
Antic Staff Writer

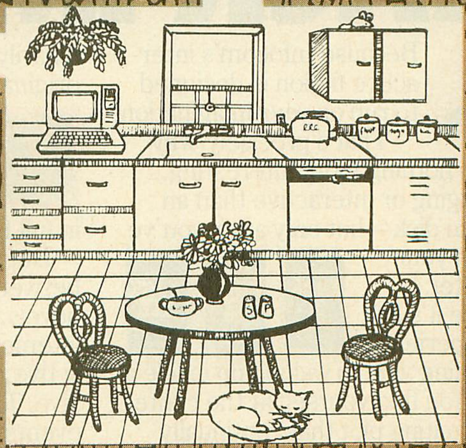


Even so, there are many exciting developments in the current generation of adventure games that will bring you new worlds to explore on your Atari.



Today the barriers between different types of games are blurring. You'll find role playing games with puzzles worthy of text adventures, and interactive adventures featuring arcade-type graphics.

continued on next page





ADVENTURE TRENDS
continued from page 23

JUPITER MISSION 1999

This blurring of genres is evident in Avalon Hill's Jupiter Mission 1999. Contained within the game's four disks are elements of graphics/text adventure, space war role-playing and arcade joystick games.

The varied elements in Jupiter Mission are tied together by a story line. Government agents drag you from your home early on a cold January morning and put you in charge of a solo mission to Jupiter.

This concept of a large-scale multiple element adventure package holds a lot of potential, even if some sections of Jupiter Mission 1999 are perhaps overly reminiscent of familiar classics such as Lunar Landing and Missile Command.

Another interesting new development is the arrival of easier adventure games for young people or younger beginners.

DRAGONS & TROLLS

There are even adventure games for children who have just learned to read. Sierra On-Line's Dragon's Keep and Troll's Tale are graphics/text adventures intended for kids as young as seven.

Young players locate a series of objects hidden by the troll or dragon—with help from warm graphics, suggestions by the computer, and a map that comes with the package.

On a typical Troll's Tale screen, you'll find the top 80 percent of the display filled with a picture of a room or a field. Below will be lines of text:

"You are facing the cave." A menu of options follows. "Go into cave," or "Turn on flashlight," or "Turn around and go into the field."

If you were to select, say, "Go into cave," without turning on the light, the next screen would show the colorful, impressive troll and warn you. "You are in the dark. Turn on light or leave the cave."

By the time you read this, possibly the Windham Classics line of interactive fiction for children will be available from Spinnaker Software. This series of graphics/text adventures is to be based on classic literature. The first Atari release will be Swiss Family Robinson.

By the way, you may have heard about Spinnaker's other new line, Trillium, which will feature adaptations of novels by big-name science fiction writers. Unfortunately, at this writing Spinnaker has no plans to produce these games for the Atari—a mistake that will hopefully be corrected by the time this is in print.

SEASTALKER

A game like Infocom's Seastalker can be enjoyed by both adult and older children who are beginning adventurers. This text adventure was scripted by Jim Lawrence, an experienced writer of books in the Tom Swift, Nancy Drew, Hardy Boys vein.

Seastalker enlists you in the Aquatic Discovery Squad. You must save the undersea Aquadome from a sea monster and saboteurs.

Seastalker is very forgiving on the beginning adventurer, offering several types of clues and extensive background information. It is a good introduction to the all-text world of Infocom for players who would be quite lost if dropped into a game like Suspended with absolutely no adventure experience.

But don't get the idea you can simply walk through this game. Seastalker is tough enough to keep a relatively experienced adventurer occupied for six to eight hours before the Aquadome is rescued.

In some more last-minute news, Infocom just announced Cutthroats, the latest game in the Tales of Adventure series. Cutthroat puts you on Hardscrabble Island, where you're a deep-sea diver on a treasure hunt with an untrustworthy crew. The game is written by Michael Berlyn, author of Infidel and Suspended.

Just as some companies have turned to noted books and authors for adaptations to interactive fiction, so has Datasoft turned to television. In The Dallas Quest, a not too inspiring graphics/text adventure, you become a detective trying to uncover a missing oil field map. The game contains several puzzles based on peculiar logic or inconsistent with the mood of the TV show.

The Ultima series, created by Lord British, combined the puzzling text adventures with scrolling map graphics and fantasy role-playing elements.

QUESTRON

Strategic Simulation's Questron is a perfect warm-up for the Ultima games. Even though Questron's scrolling map contains 57,000 squares, it's a simpler game than the classic Ultimas. Still, you'll find plenty of challenge as you move about in a strange land, encountering powerful beings who may be either good or evil. You must survive and also complete specific quests.

When you feel confident in the world of fantasy quests, step up to Ultima III, Lord British's latest adventure. In Ultima III you can go questing with a team of four characters simultaneously. Create your fantasy A-Team from five races and 11 professions, equip them from a menu of 16 weapons and 32 magic spells.

Ultima III, published by Lord British's own company, Origin Systems, upgrades the graphics, combat options, navigational strategies, and dungeon scenes from the game's two predecessors. Your adventure in this fantasy world is more realistic because of the increased detail and interaction possibilitites.

ULTIMA IV

Antic received a special Lord British communiqué for this issue. (His Lordship is actually Richard Garriott, who's in his early 20s and the son of a space shuttle astronaut.)

"As Lord British thought of the future again and touched the silver snake around his neck, he saw Ultima IV laid out beautifully before him. A new age had come upon the land of Sosaria. Evil still existed, but many had discovered the virtues of friendship and trust. All of Lord British's subjects would need the power of good in order to complete eight quests and become an Avatar. Life would be lived in a world 16 times larger than its predecessor.

continued on next page

"Lord British wondered how much longer the quests would continue. He looked out at the hardware surrounding himself and realized that he had just begun to explore the capabilities of the computer. He knew that his journeys were far from over . . ."

And Infocom also predicts major advances for its all-text adventure games. Product manager Michael Dornbrook says, "There will be effectively no limit on the number of people or rooms in a game. Think of all the limitations in current games and knock them down. Imagine many current restraints on game play eliminated."

Thus . . . adventure games have emerged from the caves as the quest for more reality continues . . .

MANUFACTURER INFORMATION

The Dallas Quest
Datasoft
19808 Nordhoff Place
Chatsworth, CA 91311
(818) 701-5161
48K disk, $34.95

Dragon's Keep
Troll's Tale
Sierra On-Line
Sierra On-Line Bldg.
Coarsegold, CA 93614
(209) 683-6858
48K disk with BASIC, $29.95 each.

Jupiter Mission 1999
Avalon Hill Games
4517 Harford Rd.
Baltimore, MD 21214
(301) 254-5300
48K disk, $50.00

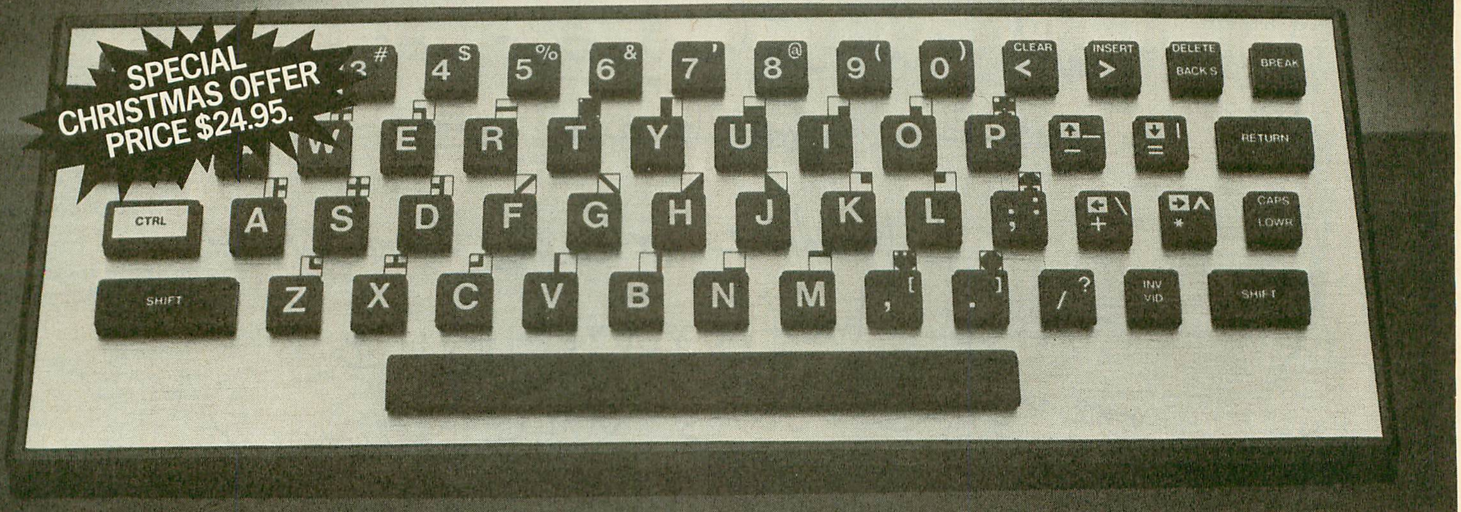
Questron
Strategic Simulations, Inc.
883 Stierlin Rd., Bldg. A-200
Mountain View, CA 94043
(415) 964-1200
40K disk with BASIC, $39.95

Seastalker
Infocom, Inc.
55 Wheeler St.
Cambridge, MA 02138
(617) 492-1031
48K disk, $49.95

Ultima III
Origin Systems, Inc.
P.O. Box 99
1545 Isgood St. #7
North Andover, MA 08125
(617) 681-0609
48K disk, $59.95

Windham Classics
Spinnaker Software
One Kendall Sq.
Cambridge, MA 02139
(617) 494-1200
48K disk, $26.95

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Enclosed is my check or money order for $ ____________. (US Dollars only.) Please charge my Visa ☐ Mastercard ☐

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Dr. Virgil, rapidly flicks a row of circuit breakers, and you feel a strange, melting sensation all through your nervous system. You black out.

You're on an immense stage. In front of you, a crowd roars like thunder. Someone has thrown a rose and a Baby Ruth candy bar onto the stage. High overhead, a huge video screen displays, over and over, the film of Bobby Clemons assassination. In tight sequined costumes, a chorus of singers writhes, imitating the gestures of the fatally wounded figure on the screen.

Mindwheel

Coming Adventures

state-of-the-art interactive fiction

by NAT FRIEDLAND
Antic Editor

Just as this **Antic** 1984 Adventure Issue was going to press, we got an advance look at two games that dramatically advance the state of the art in interactive fiction.

These groundbreaking adventures are **Alternate Reality**, a graphic scrolling role-playing fantasy from Marsten Systems, and Synapse Software's **Electronic Novels** text adventure series. These games should be out by the time you read this . . . or soon after.



The City from Alternate Reality

The authors of Alternate Reality are Phil Price and Gary Gilbertson of Hawaii's Paradise Programming. **Antic** readers saw Phil's innovative color manipulation program "Price's Picture Painter" in our August 1984 graphics issue, illustrated with an elaborate scene from the game.

Alternate Reality is to ultimately become a seven-disk series. However, if the game proves popular they can insert additional disk adventures into the middle of the series before reaching the final chapters, "Revelation" and "Destiny."

What's new about Alternate Reality is the way it combines super-detailed graphics with a very wide-scope game map plus music, scrolling text and occasional animation sequences.

As for Synapse's Electronic Novels, they are all-text adventures that boast a parser (dialog interpretation program) that seems to be as advanced as Infocom's. Five of these games are under development and their major new advance is that they offer the highest-ever degree of interaction with the story's characters.

DEMO AT ANTIC

Gary Gilbertson came into **Antic**'s office with a nearly complete version of the first Alternate Reality disk. The only missing elements were comparatively minor details such as the sun rising and setting in condensed real-time. Day and night are important in this game because a lot of monsters come out only in darkness and one of your first tasks will be to accumulate enough money to pay for indoor sleeping quarters.

The opening disk of Alternate Reality is called "The City" and you'll have to own it in order to play any of the later disks. In terms of mapping, all the other disks in the series will display territories that are adjacent to the city in some way—"The Dungeon," "The Arena," "The Palace," "The Wilderness." However, all these upcoming disks are to be independent of each other so you won't need to buy them in any particular order.

"The Dungeon" is also promised for release by the time you read this. It's to be a 12-level maze featuring more than 250 monsters. Located beneath the streets of the city, there will be a couple of ways you can teleport back above-ground to store your treasures safely.

Essentially, what you do in "The City" is wander through the streets and buildings, and build up your power points for the future disks. You'll have confrontations with the 47 types of life forms that live there—including goblins, zombies, muggers, etc. You see eye-level front views wherever you go. And you won't be quickly bored—during the demonstration an unmarked map of the 4,000-location city matrix was brought in and it looked as convoluted as a Mayan tomb decoration.



The Bar from Alternate Reality

The authors warn that you're building up karma during this phase. If you act too ruthlessly as you advance your status in the local society, you can expect to be struck down by an avenging destiny.

UFO KIDNAP

The game starts with an outstanding animation sequence. You see a detailed cityscape as a UFO flies in to grab prisoners (including you, of course). Next you're looking through the UFO's front porthole as a long series of star-strewn galaxies flashes by. Genuine computer generated music, not merely sound effects, is heard throughout all this.

continued on next page

You awaken at the portal leading to Alternate Reality. It's an open archway with sets of numbers swiftly revolving at the top. When you hit the joystick button you pass through and your starting attributes are set at the point values which were showing at that instant. You emerge into the city's main plaza.

In theory, you could "win" the game by discovering how to be transported home, even if you never get any of the other disks in the series. But the clues hinted at by Gilbertson seem pretty well buried. For example, part of the solution may be gained by charting the patterns of the UFO's route through the galactic clusters.

Marsten plans to price "The City" at $49.95 and the follow-up disks at $34.95. You'll also be able to get a $14.95 utility disk for saving six characters.

SAMPLING FIVE NOVELS

To sample the five Electronic Novels, I drove over to Synapse Software's quarters in an office park just north of Berkeley. The novels resided on a Corvus 10-megabyte hard disk accessed from an IBM PC. Richard Sanford, the project manager, explained that IBM and Apple will get the releases first. And then the programs will be adapted for the Atari and Commodore. Shipment is promised for before the end of the year, at a price of $39.95.

The two opening games in the series, "Mindwheel" and "Essex" were complete enough to be playable . . . although it wasn't difficult to run into the boundaries of the unfinished programming as you got past the opening situations.

In the other three games, about all you could do at that point was explore the introductory scenes and pick up the overall flavor of the themes. However, even these glimpses were enough to provide a tantalizing overview of the scope of the series.

"Breakers" is set on an Outlands-type mining planet which you enter by way of a sleazy interplanetary barroom reminiscent of the Star Wars cantina. "Brimstone" will have Sir Gawain descending to hell on a knightly quest, but the exits from Camelot castle weren't in place yet. "Ronin" has a great atmospheric samurai setting, and it was very frustrating that the program wasn't yet developed enough for me to save the geisha by taking on the ninja with my sword.

WHEEL OF WISDOM

Mindwheel was farthest along at the time of my preview. This adventure's dense, symbol-packed prose is far different from the kind of tongue-in-cheek stage directions we all got used to in the earlier generations of text adventures. The plot is a lot more abstract too . . .

You become the first person to survive Dr. Virgil's mind transference experiment. It's up to you to save the planet by travelling through the minds

continued on page 33

SURVIVAL OF THE SMARTEST . . .

EXCITING, NEW & DIFFERENT!

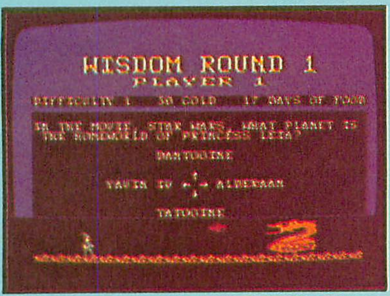
Outsmart your Friends.
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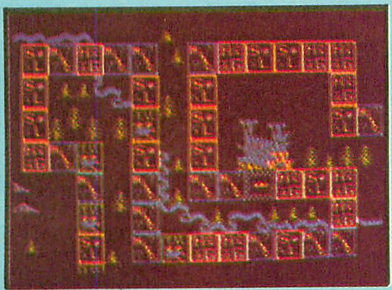
Here are just a few of many screens.



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Over 2000 stimulating trivia/fact questions will send you rummaging through your personal memory banks. Answer correctly and advance in your quest while adding more gold to your treasure. Fail and you lose ground.



THE ACTION.
You may have to face and battle a ferocious dragon. If you prevail, the dragon's cache of gold will be added to your treasure. If you fail, your journey will be slowed while you heal your wounds.



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Each questing party consists of three characters, a Knight, Prince and Page. Each has distinctly different physical characteristics, and all must complete the Quest. You must decide when to send them on to the next challenge.

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COMING ADVENTURES
continued from page 30

of a Dictator, a Rock Star, a Scientist and a Poet. When you get back to the primal level of history, find the mystical wheel of wisdom and bring it back with you. The journey starts with you as the Rock Star, performing at a huge, unruly concert and threatened by violent thugs.

I was able to move a little way into a couple of other minds from this rock concert setting, and the imagery is definitely something out of Dante's Inferno.

GIANT ROCKETSHIP

Essex is a somewhat unevocative title for the final adventure in this first batch of Electronic Novels. Actually, the Essex is a giant rocketship that's under attack from mysterious interplanetary saboteurs. As the game starts, you stumble across a murder and get a cryptic message to pass on to the captain.

I managed to get aboard the Essex just as it was blasting off. But before long I was bogged down trying to figure out how to use the computerized transporter systems and make my way to the bridge via the rocket's vast multiple levels of corridors.

This game provided an excellent example of what Synapse calls the "asynchronous universe" feature—which translates to random events. As you try to find your way around the rocket, you regularly ran into a mixed group of humans and non-humans who say different things at different meetings. Sometimes you could obtain valuable clues by speaking to these beings, at other times you just got a joke punchline.

Similar randomizing showed up in Mindwheel several ways. The rock concert crowd would start yelling song requests or throwing souvenirs every once in a while. If you got into a duel with the thug, you'd choose your weapon from one of three sealed boxes. But at various times the same box might contain either a magic talisman or a pizza.

TALK TO CHARACTERS

A lot of the data you need for advancing in these games is obtained by talking to characters. The effect can be eerily like a real dialog at times, though in other sequences it becomes obvious that this technique is still in its infancy.

It's going to be a real challenge for authors to suggest to game users when to start a dialog with the other characters, without being overly obvious about it. The situations here are somewhat more subtle than the earlier generation of text adventures where you'd be going down a murky tunnel and see a giant spider ahead.

In Mindwheel, for example, a bodyguard approaches you and says something like, "If you'd care to come with me to the green door, I might have something interesting to tell you."

Naturally, the longer inputs mean you must do more typing than if you were simply entering N, or GET LAMP. Synapse is still trying to simplify the response format before release. At the moment, you could get an answer by typing in as little as:

doc "who am i

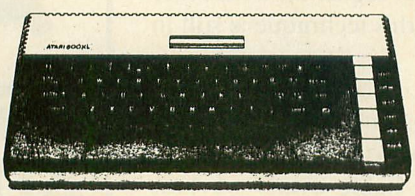
In response, you'd see:

Doctor Virgil looks at you and says, "You're the first person whose brain wasn't fried by the machine."

MANUFACTURERS OF THE GAMES DESCRIBED IN THIS ARTICLE

Alternate Reality
Marsten Systems Development
1158 Village Drive
Belmont, CA 94002

Electronic Novels
(Mindwheel, Essex, etc.)
Synapse Software
5221 Central Avenue
Richmond, CA 94804
(415) 527-7751



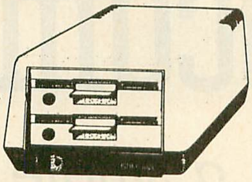
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We Solved 8 Infocoms

(. . . 4 of them in a single week)

by BETT LONG and CHUCK LANDGRAVER

*Bett Long wrote **Antic** a letter after reading the adventure game article in our August issue (p. 44) and mentioned that she and her son had solved eight Infocom all-text adventures. We were fascinated, never having heard of anybody who had actually completed that many adventures. So we promptly wrote back to Bett and asked her to send us an article about her experiences in time for the deadline of our annual adventure issue . . .*

This story arrived in three weeks under a double byline. Here's what Bett Long wrote us about herself. "I was hooked on Infocom by Chuck Landgraver, my bachelor son who does something in experimental nuclear power in the Idaho desert. I am a retired Ohio widow who does grandmotherly things when I must. Last month Chuck and I spent six days in Infocom and five days gambling in Reno. We can't decide which part of the visit was better."

—ANTIC ED

During a six day visit we finished **Deadline**, **Infidel**, **Planetfall** and **The Witness**. We had previously done **Zork I** and **Zork II**, **Starcross** and **Enchanter** by mail and phone.

We spent eight to 50 hours on each program, including studying the print-outs and talking or thinking about a problem.

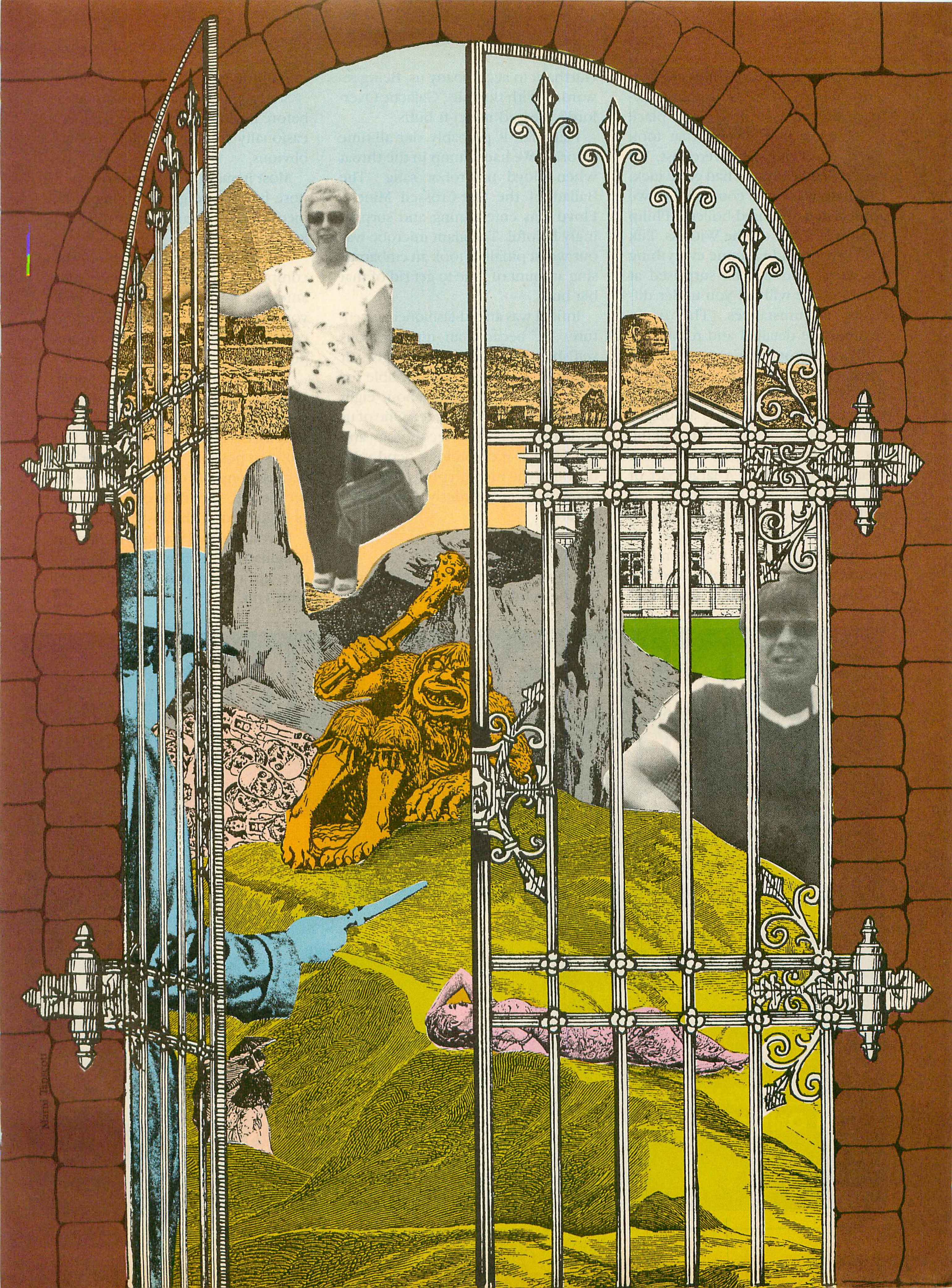
Zork I was our introduction to Infocom. Despite previous text adventure experience, this took about 50 hours. Mapping the maze was almost impossible because the thief stole articles we dropped as markers. Draining and filling the reservoir was satisfying while we were stuck badly and needed *something* to do. We knew were were making progress when we got in and out of the Machine Room. Zork II was more of the same, but it was easier and not quite as much fun. Going up the volcano was worth the trip. Getting in and out of the Bank Vault and into the workshop were the biggest headaches. Zork III awaits on the shelf.

ZIFMIA GOD

Enchanter was like reading a fascinating book and having the power to make it end well. Some enchantments were easy to control, some took much time and thought. The "kulcad" scroll was the most difficult and satisfying to get. We passed the "Guarded Door" repeatedly for comic relief. Be sure to "zifmia" God. Remember your dreams and speak to everyone, including the animals. There are 17 ways to die and at least one is vital to the solution. This is one of our two favorites. Our peek into the sequel, Sorcerer, shows promise it'll be equally good.

The authors (in sunglasses) amid some of the friendly folks they met while solving eight Infocom adventure games.

continued on page 38



Deadline and The Witness are mysteries where we became the detectives. We had to be in the right place at the right time. Events that took place out of our sight were lost. We "saved" endlessly and had good luck. Deadline was more complex but we appreciated the hard-boiled "Philip Marlowe" flavor of The Witness. Talk to everyone and examine everything for clues. You will be surprised at what people will tell you under different circumstances. The backgrounds are detailed and realistic.

Flying across the center of the "Artifact" in Starcross is a real adventure. We had some serious holdups in this game so it took nearly as long as Zork I. The hardest part was making the round trip to and from the weasels' vessel alive. A large part of the game was deciding what to do with all the rods. The most satisfying puzzle was learning to follow the compulsively neat maintenance mouse into the mouse holes. Another problem was persuading the bored Gurthark to accompany us. Being rewarded with the title "Galactic Overlord" pleased us sci-fi buffs.

Planetfall is probably our all-time favorite. We had a lump in the throat when Floyd the robot sang "The Ballad of the Star-Crossed Miner". Floyd was entertaining and surprisingly helpful. The giant microbe was our worst pitfall. It took an embarrassing amount of time to get rid of that big bug.

Infidel was an old-fashioned adventure. We became an unscrupulous selfish second-rate archaeologist. (It might be slightly uncomfortable for nice people.) We spent about eight fast-paced hours on Infidel. One of us anticipated Egyptian technology and the other is a cryptology fiend who decoded the hieroglyphics. The program was very orderly and ended suitably.

OUR ADVICE

Our best advice is to map and document carefully. A printer makes solving a little easier.

Study the packaging thoroughly before beginning and refer back occasionally for hints which become obvious.

Most items you take have one purpose but in one game we needed a piece of equipment in three different locations.

Try anything. Read *everything* the computer tells you. An answer may amuse or insult you, or be just what you hoped for. A slight variation in computer response is usually an important clue.

When you begin, explore only. When you can gather what you think you will need and are ready to be serious, make a "good save" in as few moves as possible. Don't save over this because some of your later choices are irrevocable. After that, save frequently as suggested in the instructions.

If you are lucky you will find an imaginative friend who is willing to give up a normal life to adventure with you. ▲

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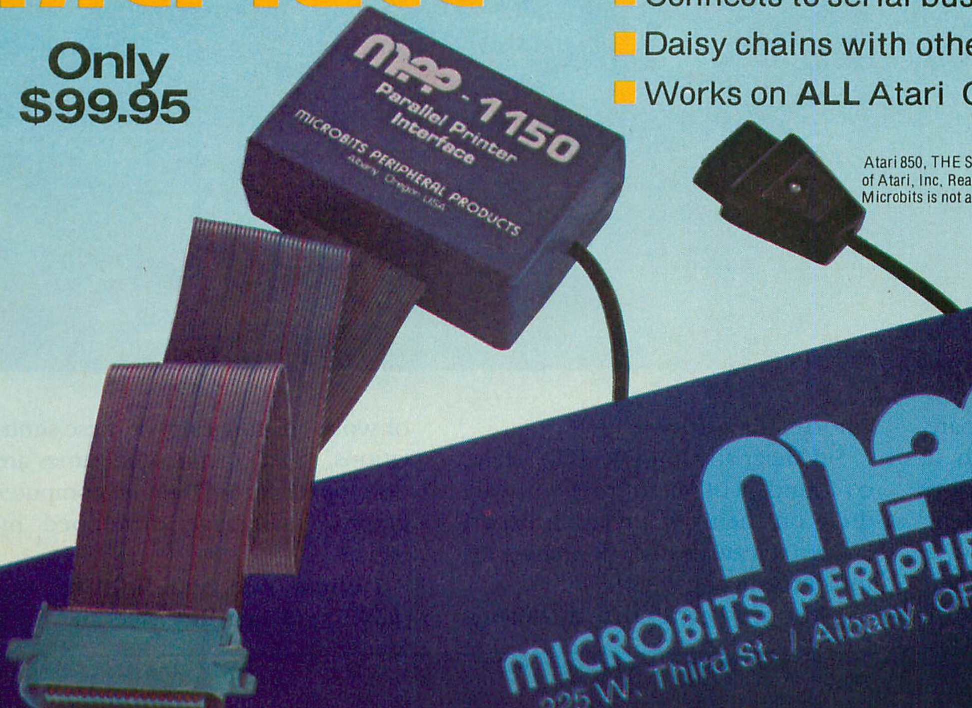
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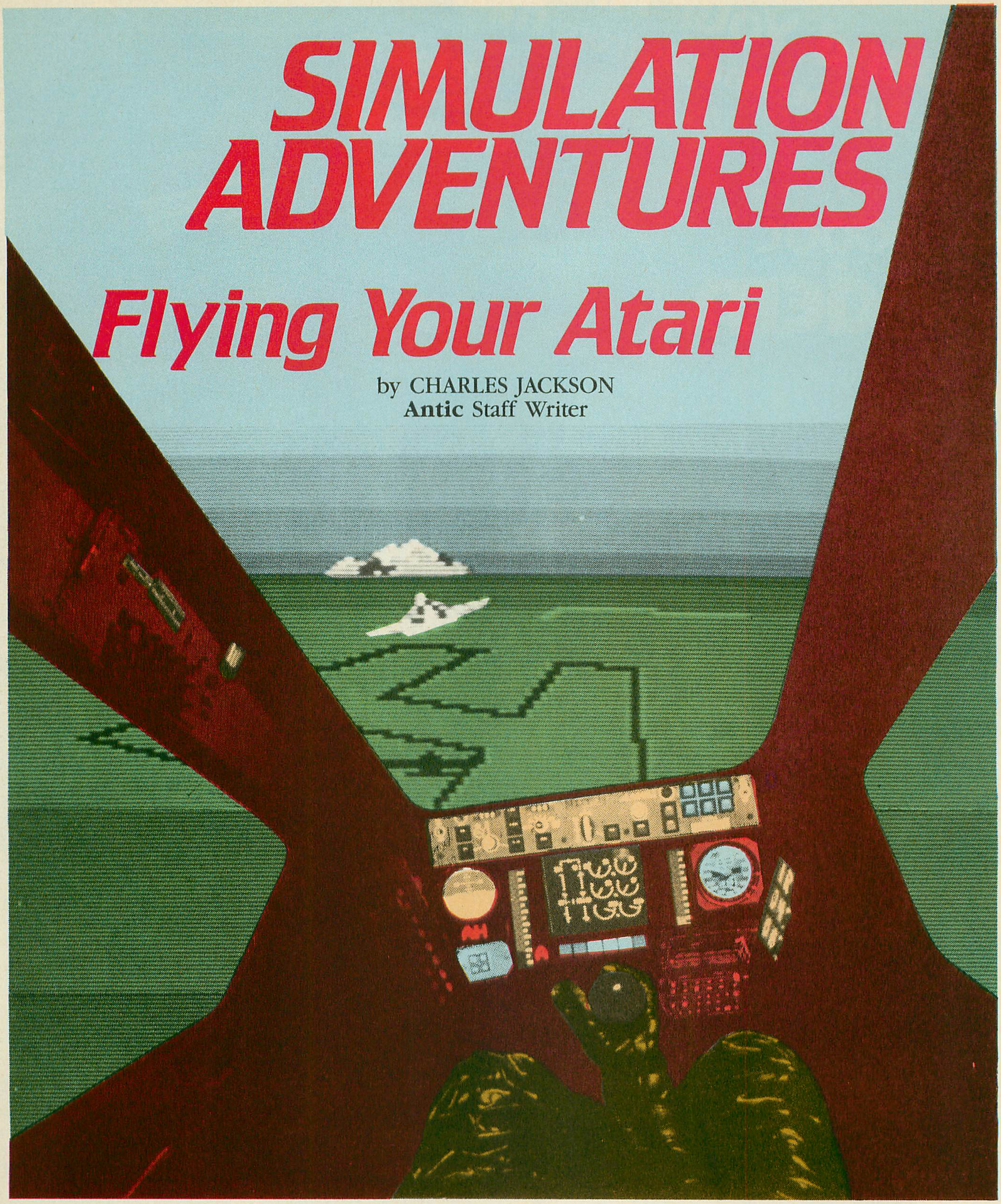
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SIMULATION ADVENTURES

Flying Your Atari

by CHARLES JACKSON
Antic Staff Writer



Turn on your Atari and prepare to earn your wings with a MicroProse flight simulation program. Pilot a realistic light plane across the USA or climb into a jet fighter and take part in an accurate recreation of one of history's most colorful air battles.

Sid Meier and John W. (Bill) Stealey, co-founders of MicroProse Software, drew on their own aviation experiences to create nearly a dozen successful simulation games.

"We spend better than a man-year of work creating each of these simulations," Stealey said. The games are developed in SidTran, a computer graphics language developed by Meier.

Hellcat Ace and **Spitfire Ace** ($29.95), **Mig Alley Ace** and **F-15**

Strike Eagle ($34.95) are joystick-controlled flight simulations that each realistically duplicate an actual aircraft's speed, and maneuverability. The simulated planes climb, dive, roll and loop just as quickly as the aircraft they're modeled after. Even the instrument panels are similar. For example, many of the F-15's new computerized displays and avionics are included in MicroProse's F-15 Strike Eagle game.

Spitfire Ace puts you in the cockpit of a British fighter during World War Two. Mig Alley Ace takes place during the Korean War, and gives you a choice of battlefields and aircraft. These aircraft include: an F-80 Shooting Star, an armed C-119 cargo transport, an F9F Panther, an F-84 Thunderjet and an F-86 Sabrejet.

Bill Stealey of Microprose



DAVID TERLIZZI

REAL PILOTS

Stealey, an Air Force Academy graduate, helped train more than 200 pilots to Fly T-37 jets. He has also piloted massive C-5A Galaxy cargo planes in the United States and Europe. Today, Stealey flies A-37 jets for the Pennsylvania Air National Guard's 103rd Tactical Air Support Squadron. He has logged over 3,000 hours in the air.

Meier has been writing Atari simulation games since 1982. His first game, Hostage Rescue, is a simulation of the 1980 Iranian Hostage helicopter rescue attempt. Meier and Stealey met at an Atari user's group meeting.

Most recently, Meier and Stealey developed **Solo Flight** ($34.95). This real-time flight simulator puts you behind the joystick of a small, single-engine private plane. And it's realistic enough to be used for practice by student pilots.

Levels of difficulty in Solo Flight range from flying over flat terrain in clear, calm weather to navigating through dense clouds over wind-swept mountains. You can practice taking off or landing in your choice of conditions too.

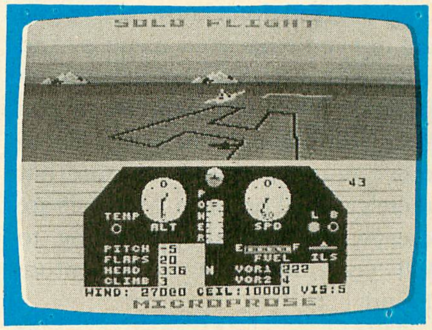
Once you're comfortable flying in all types of weather, you can advance to the mail delivery option.

The Solo Flight airplane features retractable landing gear, brakes, three-position flaps, an Instrument Landing System (ILS), dual VORs (radio navigation equipment), and realistic altitude and airspeed indicators.

SIMPLE FLYING

Though the Solo Flight aircraft simulates a sophisticated light plane, it is simple to fly. Even keyboard pilots who ignore the instruction booklet should have little trouble staying aloft.

The bottom half of the game's screen reproduces instrument panel data. However, the top half is not the view from the cockpit window. Instead it's a rear view of the aircraft superimposed on the horizon. Depth is gauged by comparing the size of this aircraft to the sizes of runways and other nearby ground checkpoints. Whenever the aircraft descends below 600 feet, its altitude can also be judged by the shadow it casts on the ground. This shadow appears even when the sky is gray and overcast.



The Solo Flight plane's instrument panel substitutes digital readouts for most of the dials found on standard instrument panels. Pitch angle, flap setting, heading, rate-of-climb, and bearing from VOR navigation stations are all seen on digital displays. Though the Solo Flight altimeter looks like a standard altimeter, it skips the "8" and "9" positions.

Simulated aeronautical charts of Kansas, Colorado and Washington are included in the Solo Flight package. Each chart contains diagrams of seven airports and two VOR stations. Several approach plates are also included. At the close of your flight, the game is also able to plot your course on a map.

"From delivering the mail to shooting down enemy fighters, each one of our simulation programs is based on complex real-life experiences," Stealey said, "and our programs put you in the middle of those experiences. We want you to have fun while you feel what it would be like to be a jet fighter pilot."

Microprose Software
10616 Beaver Dam Road
Hunt Valley, MD 21030
(301) 667-1151

ADVEN ISLA

by ROBERT LEE

You awaken with a headache and total amnesia. You don't know where you are or even what your name is. And what is this strange power you now possess? Every time you use it, you hear a loud noise! You would like to move around and find out more, but there's a small problem. Monsters are everywhere and they're trying to kill you! Welcome to Adventure Island . . .

This game combines elements of fantasy role-playing and text adventures. Discovering your identity is the mystery you must solve. Meanwhile, you're a fighter seeking treasure, exploring caves, and doing battle with multitudes of monsters.

If you haven't played fantasy role-playing games such as Ultima and Temple of Apshai before, you should know about the relationship between experience and hit points. As you travel about in the game, you'll encounter many monsters—at which time you usually have the option of fighting or running. If you fight and vanquish an enemy, you gain experience points. However, each time the enemy strikes you, you lose hit points—which indicate how much more damage you can survive. You die when you have less than one hit point. Higher experience levels benefit you primarily by increasing your maximum hit points. A visit to the inn restores your hit points to full level.

GETTING STARTED

Type in the listing, check it with TYPO, and SAVE two copies, one for a backup. When the game starts, you'll be asked if you want to restart an old game. The first time, type [N][RETURN]. Then you're asked for an experience level. Start with a level of 1. You're likely to be killed right away, but you can always reincarnate your character to restart the game. When you're killed, if you've earned enough experience points by killing monsters and collecting treasure, you'll automatically advance a level when you restart.

After you enter your experience level, the program will randomly generate values between 6 and 18 for your character's six traits—the higher the value, the better. Strength is important for attacking monsters and gaining experience. Constitution affects your initial number of hit points. Intuition is useful in finding and examining objects, while intelligence is necessary to locate exits. Speed determines whether you or the monster gets the first blow, and visage determines the likelihood of your being chased by monsters.

Here's a list of commands:

N	North
S	South
E	East
W	West
X	Examine everything (look around)
G	Get
D	Drop
I	Inventory and Status
F	Try it!!
A	Attack with sword or thrust with spear
T	Throw spear
FP	Fire poison arrow
FS	Fire silver arrow
ET	Eat
DK	Drink
QT	Quit
SG	Save Game

Any other key, including [RETURN] alone, gives you the above list.

USING COMMANDS

Use Get, Drop, Eat, and Drink commands without an object. You'll be prompted to enter the object, at which you must type in the exact name, or the program won't recognize the object. The computer signals you audibly two moves and one move before you must eat and drink. Beware of every object you see or touch. Magic items are used just by touching them, and their effects can be subtle.

When you Attack, the program first checks your inventory for a magic sword, a plain sword, or a spear, in that order. If you have any of these, an attack is attempted. Monsters attack only one at a time, even if there are more than one, and you may fight them only one at a time.

Inventory tells you what you're carrying and how many hit points you've left. You can carry only ten items at a time, although the amount of gold pieces (gp) you can hold is unlimited.

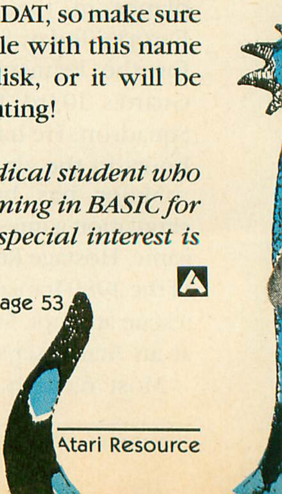
Although you're always informed of visible objects and exits when you enter a room, Examine lets you check this again. Note that this information can change randomly during a game.

Command F is your secret power—one of the game's dark secrets. You should know what it is by game's end.

You can save a game on disk or cassette. Saving on cassette takes about two minutes. Game storage on disk uses a file called AI.DAT, so make sure you don't have a file with this name already on your disk, or it will be erased. Happy hunting!

Robert Lee is a medical student who has been programming in BASIC for several years. His special interest is adventure games.

listing continued on page 53



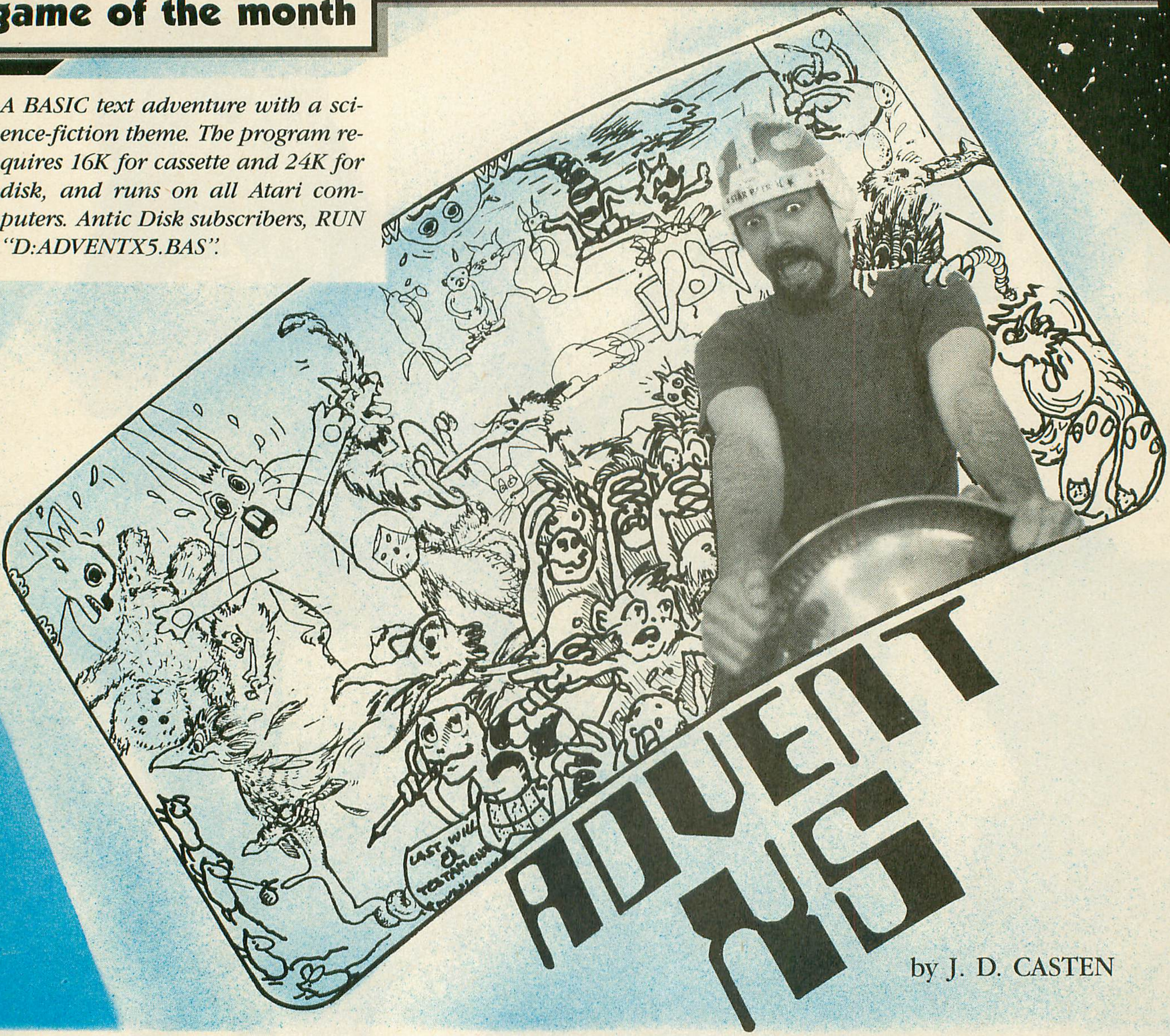
TURE
ND



A fantasy role-playing game with an adventure-type mystery to solve. This BASIC game requires 32K for cassette and 40K for disk systems, and runs on all Atari computers. Antic Disk subscribers, RUN "D:ADVNTISL. BAS".

KYLE BOGERTMAN

A BASIC text adventure with a science-fiction theme. The program requires 16K for cassette and 24K for disk, and runs on all Atari computers. Antic Disk subscribers, RUN "D:ADVENTX5.BAS".



ADVENT X5

by J. D. CASTEN

You're the sole crew member aboard the Advent X-5, a space ship designed to transport small animals. Your most recent mission was to take some animals to a planet called Klybex-6 to test their reactions to its thick atmosphere and low gravity. But on the way to Klybex-6, a meteor storm forced you to crash-land the Advent X-5 on Klybex-7.

You're now stranded on the ship, and must get to the emergency shuttle craft and blast off to the nearest star base . . .

Type in the listing, check it with TYPO, and SAVE an extra backup copy. When you RUN it, you'll see the game menu:

1. Play Game—Plays game currently in memory—picks up where you left off.
2. Load Game—Recall a previous game from disk or cassette.
3. Save Game—Save the current game to disk or cassette.
4. New Game—Restart old game from the beginning.
5. Quit Game—Exit from the program.

To return to the menu during game play, enter QUIT or SAVE. There are no prompts for Load and Save game. If you're using disk, the program uses the filename "ADVENTX5.DTA". If you're using cassette, the computer beeps once for Load and twice for Save. Prepare your recorder, then press [RETURN].

During the adventure, use simple noun-verb phrases to accomplish tasks. Examples are GET DISK, GO NORTH (can be abbreviated to N), and ENTER DOOR. Directions can usually be abbreviated. You can (and sometimes must) also refer to containers, such as PUT HAT IN BOX, or TAKE SYRINGE FROM CABINET. Good luck!

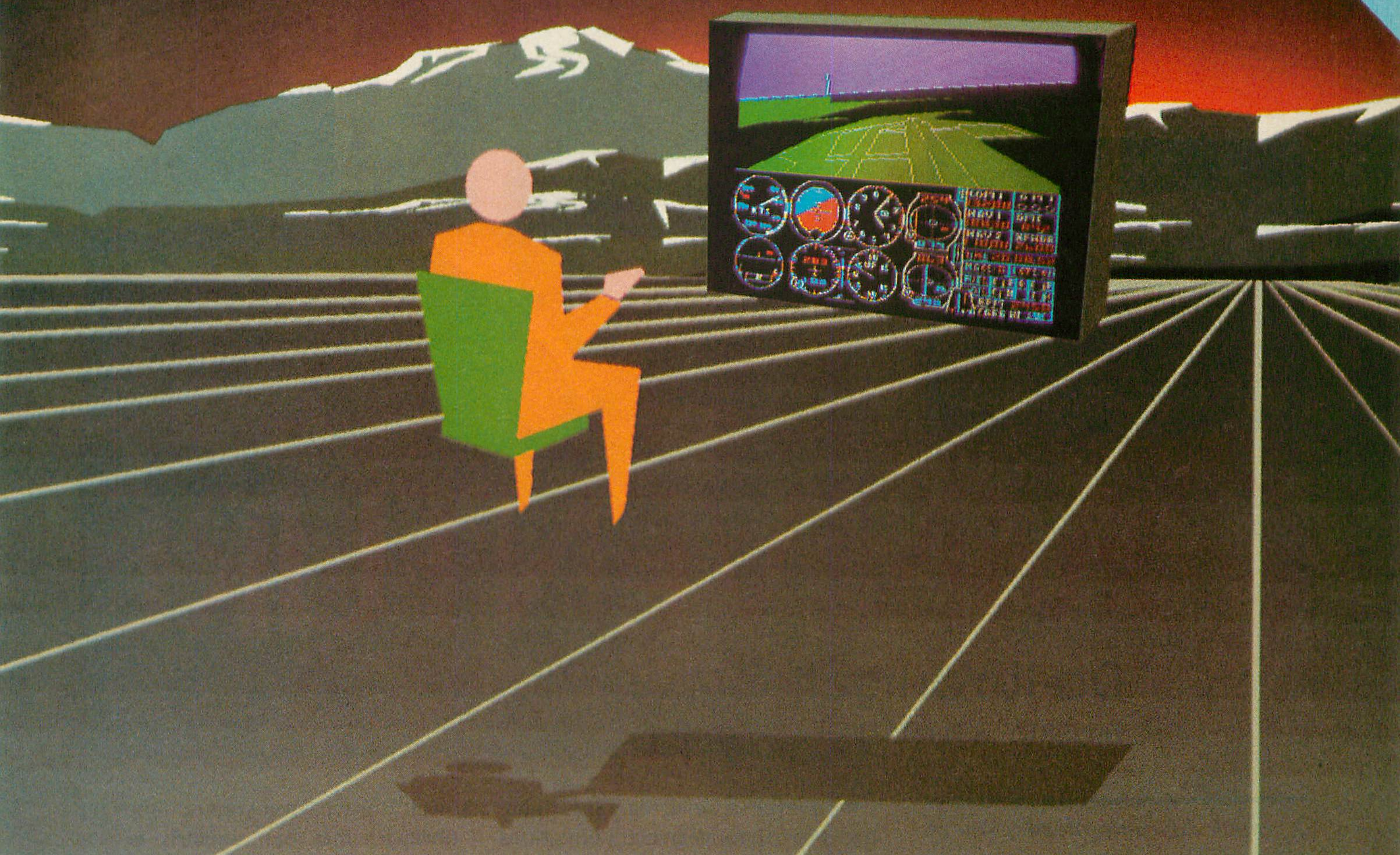
NOTE: Please don't call **Antic** for the solution, but we can assure you that there is one.

J. D. Casten is the author of one of ***Antic's*** *most popular games ever—"Risky Rescue" in the April 1984 issue. He has been programming in BASIC since age 13, and is currently writing assembly language games for the commercial market.*

listing continued on page 60

Flight Simulator II

For Atari computers with 48K memory



Put yourself in the pilot's seat of a Piper 181 Cherokee Archer for an awe-inspiring flight over realistic scenery from New York to Los Angeles. High speed color-filled 3D graphics will give you a beautiful panoramic view as you practice takeoffs, landings, and aerobatics. Complete documentation will get you airborne quickly even if you've never flown before. When you think you're ready, you can play the World War I Ace aerial battle game. Flight Simulator II features include ■ animated color 3D graphics ■ day, dusk, and night flying modes ■ over 80 airports in four scenery areas: New York, Chicago, Los Angeles, Seattle, with additional scenery areas available ■ user-variable weather, from clear blue skies to grey cloudy conditions ■ complete flight instrumentation ■ VOR, ILS, ADF, and DME radio equipped ■ navigation facilities and course plotting ■ World War I Ace aerial battle game ■ complete information manual and flight handbook.

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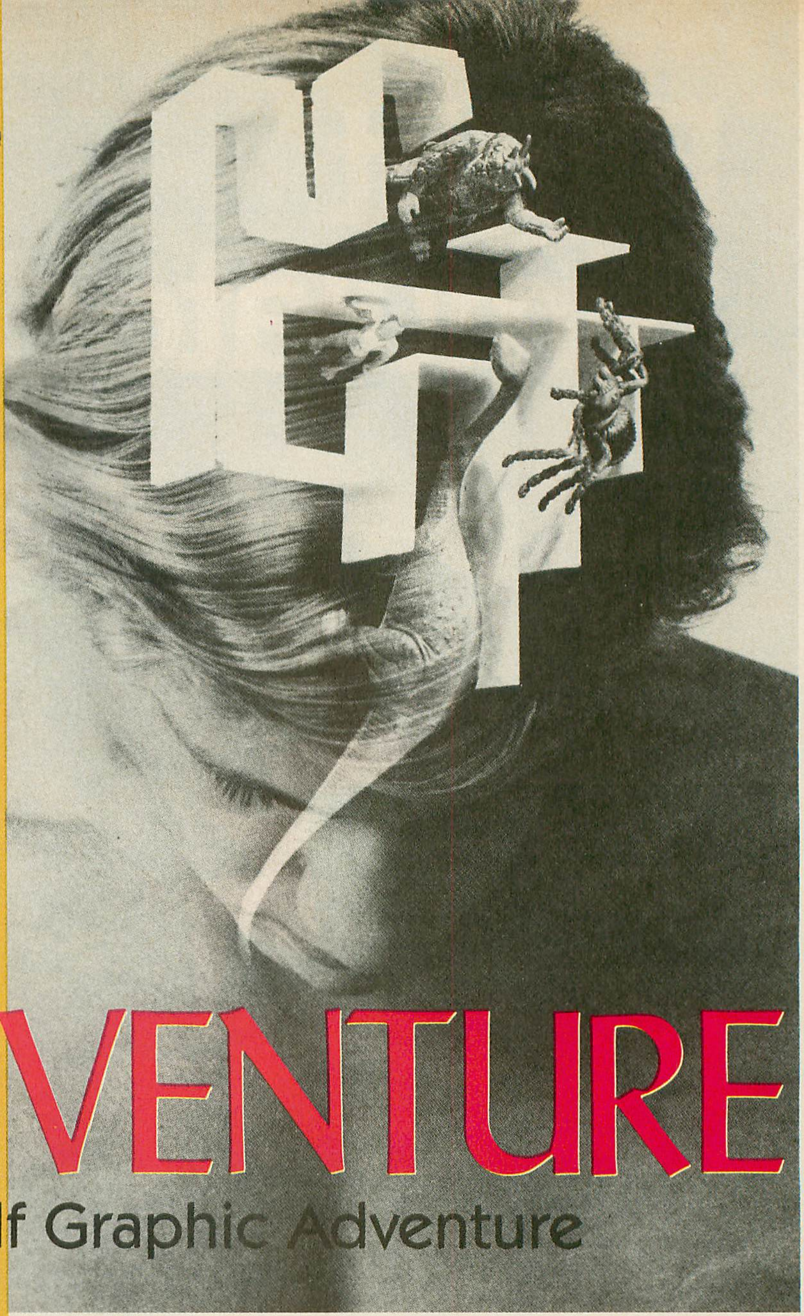
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LINDA TAPSCOTT

OMNIVENTURE

Do-It-Yourself Graphic Adventure

by JERRY A. LEMAITRE

A graphic adventure/arcade game in three versions—plus instructions for easily customizing the game even more. The program runs on all Atari computers of any memory configuration. Antic Disk subscribers RUN "D:OMNIVENT.BAS".

The prefix omni means, roughly, "all-encompassing." Omniventure is a fast arcade/adventure game written completely in BASIC. You can easily modify it into many different themes that you choose. It's a great practice tool for beginning graphics adventure programmers.

Listing 1 is "Dinoventure." Type it in, check it with TYPO, and SAVE a backup copy or two.

RUN the program and you'll see your player, a small dancing figure that you can move in eight directions with a joystick. Your path through the randomly-created maze is blocked by two types of obstacles—enemies and walls. There are two kinds of enemies, placed randomly about the playfield. The number of enemies depends on the skill level at which you're playing. To defend yourself, you'll find weapons in various places about the maze. Pick one up by passing over it. If you're carrying a weapon and standing directly beside an enemy, press the fire button to use the weapon (each can only be used once!) and kill the enemy. You need not aim the joystick.

You can also pick up "tools" throughout the maze. Each of these can be used once to break through a "wall" (or whatever your non-moving obstacles may be), similarly to destroying an enemy with a weapon.

Lastly, but not least, are the treasures. Pick up as many of these as you can. They are also randomly placed, and the number depends on the skill level.

You can only carry one item (excluding treasure) at a time. Whenever you want to go to another screen, touch the wiggling 'space warp' line at the top of the screen. Your goal is to pick up the highest amount of treasure points.

You start with three players, with figures representing the number of remaining players displayed in the upper right corner.

continued on page 49

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OMNIVENTURE
continued from page 46

DRAGOVENTURE AND ROBOVENTURE

Listing 1, the main program, is already set up for Dinoventure. Listings 2 and 3 provide alternate data for the variant games—Dragoventure and Roboventure. Type them in and LIST them to disk or cassette. To convert Dinoventure, first LOAD the main program, then ENTER Listing 2 or 3. Antic Disk subscribers LOAD"D:OMNIVENT.BAS", then ENTER"D:DRAGVENT.LST" or ENTER"D:ROBOVENT.LST". If you want to speed up the game, you can get rid of a delay loop by changing line 500 to:

```
500 CH=CH+1:POKE 756,CH(CH):
    IF CH=1 THEN CH=-1.
```

CUSTOMIZING OMNIVENTURE

Here's a step-by-step method for creating your own Omniventure games.

1. Think up a title and a theme for your game, and determine what type of obstacles, enemies, weapons, tools, and treasures are best suited for your theme.

2. Change the REM statements in lines 2 and 3 to show your name and the new title.

3. Change line 9010. Make A$ your weapon's name, B$ the tool's name, and C$ your prefix for "-venture" to make up the title. NOTE: the length of both A$ and B$ should equal nine—pad with spaces if necessary. Also, C$ shouldn't contain more than seven characters.

4. See Figure 1 to find which lines change for the title screen.

5. Change the numbers in line 10030 to represent the colors you want. Here's how: a) choose the number you want from Figure 2. b) Add a number between 0 and 15 for brightness (0=very dark, 15=very light). c) Figure 3 shows which color registers are used for the game's various elements. Find the corresponding POKE in line 10030, then change the second number (the one after the comma) to the one you've selected.

6. Draw your figures on graph paper so they fit into an eight-by-eight square, then calculate the eight data values for each character. For each row, add up the values of the columns containing filled-in squares (the bits are "on"). See Figure 4. Also see "Character Graphics" (**Antic**, February 1984) for further information on developing custom characters. Design two images or 'frames' each for enemies and treasures. This creates a sort of animation when the program alternates between the two images.

7. Use Figure 5 to place the data from step 6 into the program. In lines 9230–9250, place data after the first number as shown in Figure 5.

PROGRAM TAKE-APART

100– 300	Move man and adjust for carrying an object
310– 440	Check for fire button and use object being carried
500	Delay loop and alternate character frames
510– 570	Move antagonists
6000– 6200	Death routine
9000– 9020	Title screen and dimension strings and variables
9030– 9266	Initialize character set
9270	Set movement variables
9300– 9390	Welcome screen
10000–10110	Draw playfield and position characters

(note: I did cheat a bit by using a Machine-Language subroutine to copy the character sets but it doesn't affect game play.)

Jerry A. LeMaitre is a high school student in Collingwood, Ontario. He is currently starting his own business selling software and computer accessories.

Figure 1
Welcome Screen

line	subject
9320	weapon
9330	tool
9340	treasure
9350	antagonist #1
9360	antagonist #2
9370	obstacle #1
9380	obstacle #2

Figure 2
Colors

color	number
grey	0
gold	16
orange-brown	32
red-orange	48
pink	64
purple	80
purple-blue	96
blue	112
blue	128
light-blue	144
turquoise	160
green-blue	176
green	192
yellow-green	208
orange-green	224
light-orange	240

Figure 3
POKE Numbers

subject	POKE
antagonists	708
obstacles	709
treasures	710
tools, weapons	711
you	711
background	712

continued on next page

bonus game

Figure 4
Creating Characters

128	64	32	16	8	4	2	1	FRAME 1
					×	×		2+4=6
					×	×	×	8+4+2+1=15
				×	×			8+4=12
				×	×	×	×	8+4+2+1=15
×			×	×	×		×	128+16+8+4+1=157
×			×	×	×			128+16+8+4=156
×			×	×	×	×		128+16+8+4+2=158
	×	×	×		×	×	×	64+32+16+4+2+1=119

The data for this character is: 6,15,12,15,157,156,158,119

128	64	32	16	8	4	2	1	FRAME 2
			×	×				16+8=24
		×	×	×	×			32+16+8+4=60
				×	×			8+4=12
				×	×	×	×	8+4+2+1=15
	×		×	×	×		×	64+16+8+4+1=93
×			×	×	×			128+16+8+4=156
×			×	×	×	×		128+16+8+4+2=158
	×	×	×		×	×	×	64+32+16+4+2+1=119

The data for this character is: 24,60,12,15,93,156,158,119

Figure 5
Data Lines

line number	data for . . .
9060 DATA	(antagonist #1, frame 1)
9070 DATA	(antagonist #2, frame 1)
9080 DATA	(obstacle #1)
9090 DATA	(obstacle #2)
9100 DATA	(weapon)
9110 DATA	(tool)
9120 DATA	(treasure, frame 1)
9230 DATA 2,	(antagonist #1, frame 2)
9240 DATA 3,	(antagonist #2, frame 2)
9250 DATA 8,	(treasure, frame 2)

listing continued on page 64

SOFTWARE LIBRARY

Antic proudly presents our type-in listing section—includes every full length program from this issue. Easier to read, easier to type, easy to remove and save in a binder if you wish.

Antic listings are printed out with the updated version of **Lister Plus** software. Non-Standard Magic, P.O. Box 45, Girard, Ohio 44420, $19.95 48K disk)

DISK SUBSCRIBERS: You can use all these programs immediately. Just RUN the correct filenames shown at the beginning of each accompanying article.

ERROR FILE

Following are the known program listing errors from the most recent issues of **Antic**. See the *Help* page in this issue for any additional last-minute corrections. If an error is not shown on these pages, all programs seen in **Antic** should RUN as published. The vast majority of problems that people have in getting a program to work properly are caused when they make common typing mistakes.

RISKY RESCUE
April '84

Runs as published. Readers are having problems with inverse closed parenthesis' in lines 610–730. They all look different but are all the same character.

UPDATE DISKS WITH NOTE AND POINT
April '84

Line 160 should read GOTO 610. Lines 410, 440, 470, 500 and 530 should all begin: INLEN=LEN(USER$).

MATH WIZARD
April '84

The 17th string character in line 50 should be an inverse zero. This will generate the proper Typo table.

MATCHBOX TIC-TAC-TOE
April '84

Change line 2078 to: 2078 CLOSE #3:RETURN

SPACED-OUT NUMBERS
July '84

For non-XL machines, change line 31040 as follows: 31040 D=INT (VAL(C$)/INT($100^{2}$∧(68–B(0)) +1.0E–03)).

COLOR FINETUNER
June '84

The second line of the fragment of assembly code labelled "INSTAL" should read: LDX #CHECK1/$100. The last line of the first section of code labelled "CHECK 2" should be: BNE EXIT. The second line of "FCOLOR" should be LDA PCOLRO.X.

LITTLE BROTHER GROWS UP
April '84

Various components listed within the article are incorrect. Go by the schematic which is correct.

6502 DISASSEMBLER
March '84

Will not run in ValForth; requires FigForth or Atari APX Forth. In Screen #30, lines 10 & 13 should read: 10 0< IF DROP DROP I 0 LEAVE 13 0 VARIABLE POINTER.

ESCAPE MAZE
March '84

Add the following line: 75 HIT=0.

RECALL
August '84

To get this program to run, you must first LIST it to disk or cassette. Type NEW and then type DIM QQ$(1). After this, ENTER the program. SAVE this version which will run from then on without the preliminaries.

CREEPY CAVERNS
August '84

In line 10, change M0(N,5) to M0(P,5). In line 349, there is a Y0 (Y-ZERO) that should be YO (with capital letter O). This first change will prevent an error 3 and the second an error 9.

AMODEM
July '84

There is an error in the instructions of the R-Receive procedure (and others that mention filenames). Do not include quotes when typing in a filename during the run of the program.

LISTING CONVENTIONS

Our listing printouts represent all ATASCII characters as they appear on the video screen. You generate some characters by a single keystroke, for example, the regular alphabet. Others require a combination or sequence of keystrokes. In this table, ESC means *press and release* the escape key before pressing another key. CTRL or SHIFT means *press and hold* the control or shift key while simultaneously pressing the following key.

The Atari logo key (Λ) "toggles" inverse video for all alphanumeric and punctuation characters. Press the logo key once to turn it on; press again to turn it off. In the XL line there is no logo key; inverse video is controlled by the Reverse Video Mode key. Decimal values are given as reference, and correspond to the CHR$ values often used in BASIC listings. Please note that the boxes around the special characters in the NORMAL VIDEO table are included only for visual reference. These boxes do not appear in the listed programs.

NORMAL VIDEO

FOR THIS	TYPE THIS	DECIMAL VALUE
	CTRL ,	0
	CTRL A	1
	CTRL B	2
	CTRL C	3
	CTRL D	4
	CTRL E	5
	CTRL F	6
	CTRL G	7
	CTRL H	8
	CTRL I	9
	CTRL J	10
	CTRL K	11
	CTRL L	12
	CTRL M	13
	CTRL N	14
	CTRL O	15
	CTRL P	16
	CTRL Q	17
	CTRL R	18
	CTRL S	19
	CTRL T	20
	CTRL U	21
	CTRL V	22
	CTRL W	23
	CTRL X	24
	CTRL Y	25
	CTRL Z	26
	ESC ESC	27
	ESC CTRL —	28
	ESC CTRL =	29
	ESC CTRL +	30
	ESC CTRL *	31
	CTRL .	96
	CTRL ;	123
|	SHIFT =	124
	ESC SHIFT CLEAR	125
	ESC DELETE	126
	ESC TAB	127

INVERSE VIDEO

FOR THIS	TYPE THIS	DECIMAL VALUE
	Λ CTRL ,	128
	Λ CTRL A	129
	Λ CTRL B	130
	Λ CTRL C	131
	Λ CTRL D	132
	Λ CTRL E	133
	Λ CTRL F	134
	Λ CTRL G	135
	Λ CTRL H	136
	Λ CTRL I	137
	Λ CTRL J	138
	Λ CTRL K	139
	Λ CTRL L	140
	Λ CTRL M	141
	Λ CTRL N	142
	Λ CTRL O	143
	Λ CTRL P	144
	Λ CTRL Q	145
	Λ CTRL R	146
	Λ CTRL S	147
	Λ CTRL T	148
	Λ CTRL U	149
	Λ CTRL V	150
	Λ CTRL W	151
	Λ CTRL X	152
	Λ CTRL Y	153
	Λ CTRL Z	154
	ESC SHIFT DELETE	156
	ESC SHIFT INSERT	157
	ESC CTRL TAB	158
	ESC SHIFT TAB	159
	Λ CTRL .	224
	Λ CTRL ;	251
	Λ SHIFT =	252
	ESC CTRL 2	253
	ESC CTRL DELETE	254
	ESC CTRL INSERT	255

ADVENTURE ISLAND

LISTING 1

```
0 REM ADVENTURE ISLAND
      BY ROBERT LEE
      ANTIC MAGAZINE
1 GOTO 10
2 ? :? "PRESS RETURN TO CONTINUE";:INP
UT C$:? "↖":RETURN
3 V=0:FOR W1=A TO U:V=V+INT(RND(0)*T):
NEXT W1:V=V+U:RETURN
4 GOSUB 340:GOTO 149
5 ? :RESTORE S+N1:FOR X=A TO N2:READ X
$,Y,ZZ:? X;")";X$;:FOR Z=A TO 15-LEN(X
$):? ".";:NEXT Z
6 ? Y;:IF Y<H THEN ? " ";
7 ? " GP":NEXT X
8 ? :? "'TELL ME THE # OF ITEM YOU WAN
T.     SAY NONE IF YOU'RE DONE.'":RETUR
N
10 O=0:A=1:B=2:C=3:D=4:E=6:F=8:G=9:H=1
0:I=B*H:J=H*H:K=J*J:R=F*J:S=G*J:Q=C*E:
A1=171:SY=660:YS=430
12 OX=12:OY=13:DIM C$(I),E(I),F(B),W(A
),S(D),TM(A1,D),X$(120),T1$(I),T2$(I),
M$(D),MX$(D)
13 GRAPHICS Q:POSITION A,D:? #E,"
      ADVENTURE ISLAND":FOR X=A TO S:N
EXT X
14 GRAPHICS O:POKE 710,254:POKE 709,24
4:POKE 83,37
15 ? :? "RESTORE OLD GAME(Y/N)";:INPUT
 C$:IF C$<>"Y" THEN GOTO Q
16 GOSUB 2950:GOSUB 2920:? :? "EXPERIE
NCE LEVEL: ";LL:GOSUB 640:GOSUB 630:GO
SUB B:GOSUB 450:GOSUB B
17 GOSUB 92:GOSUB 380:GOTO 150
18 GOSUB 750
19 TRAP 19:? :? "EXPERIENCE LEVEL";:IN
PUT LL:IF LL<A THEN 19
20 T=E:U=C:GOSUB C:CS=V:GOSUB C:CI=V:G
OSUB C:CW=V:GOSUB C:CO=V:GOSUB C:CD=V:
GOSUB C:CH=V
40 GOSUB 640:? :? "TRY ANOTHER CHARACT
ER(Y/N)";:INPUT C$:IF C$="Y" THEN 20
59 GOSUB 759
64 T=F:U=C:GOSUB C:GP=V+C:GP=INT(GP*D)
65 GOSUB 630:OLDHP=HP
66 GOSUB B
90 RESTORE K+J*X1+Y1:READ L,M$,X$:GOSU
B I*J
91 GOSUB 92:GOTO 130
92 RESTORE K+J*X1+Y1:READ L,M$,X$:IF L
EN(X$)<>A THEN ? X$:RETURN
93 ON ASC(X$)-64 GOTO 94,95,96,97,98,9
9,100,101,102,103,104,106,108,109,110,
111
94 ? "JELLO BRICK ROAD":RETURN
95 ? "DIMLY-LIT CAVES":RETURN
96 ? "SEEMINGLY ENDLESS ROWS OF RED DO
RIC COLUMNS.":RETURN
97 ? "GHOULISH COOLISH GREENISH FOREST
":RETURN
98 ? "HOT MUGGY SWAMPLANDS":RETURN
99 ? "BENEATH A GREAT PINK SANDSTONE W
ALL":RETURN
100 ? "CURIOUS GARDEN OF WILD FLOWERS"
:RETURN
101 ? "A CUBICLE INSIDE THE TEMPLE":RE
TURN
102 ? "HALL OF MIRRORS":RETURN
103 ? "GLOWING UNDERGROUND RIVER":RETU
RN
104 ? "IN A NARROW CRACK-LIKE TUNNEL":
RETURN
106 ? "ANCIENT WEED-OVERGROWN ROAD PAV
ED    WITH HUGE BLOCKS OF GRANITE.":RET
URN
108 ? "GOLDEN BEACH":RETURN
109 ? "HIGH WHITE CHALK CLIFFS":RETURN

110 ? "THE SHINING SEA":RETURN
111 ? "BARREN ROCKY ISLET":RETURN
120 INPUT X$:? :RESTORE 999:FOR C1=A T
O Q-A:READ C$
121 IF X$=C$ THEN RETURN
122 NEXT C1:GOSUB C*J:C1=O:RETURN
125 IF CN=DC THEN ? "THIRSTY?":HP=O:GO
TO 350
126 IF CN=FC THEN ? "HUNGRY?":HP=O:GOT
O 350
127 CN=CN+A:RETURN
130 GOSUB 380:GOSUB H*J:IF TM(L,D)>O A
ND INT(RND(O)*(CD+SCD)/F)=O THEN GOSUB
 340
149 GOSUB 560
150 ? :? "ENTER COMMAND: MOVE NUMBER "
;CN
151 ? "EAT BY MOVE ";FC;"  ";"DRINK BY
 MOVE ";DC:IF CN>=FC-A OR CN>=DC-A THE
N ? "⊠";
153 GOSUB 120:IF C1<A THEN 150
154 C2=C1:ON C1 GOSUB SY,SY,SY,SY,380,
470,530,450,580,YS,YS,YS,YS,1100,1200,
625,2900
155 GOSUB 125:ON C2 GOTO D,90,O,O,D,D,
D,D,D,D,D,D,D,D,D,601,150
199 ? "A MAID ASKS 'WOULD YOU BE WANTI
N'    ANY FOOD OR DRINK'(Y/N)";:INPUT C
$:IF C$="N" THEN 213
200 ? "SHE SHOWS YOU A MENU."
201 ? :? "FOOD & DRINK":GOSUB 5
205 TRAP 213:INPUT T:IF T<A OR T>N2 TH
EN 205
206 IF W=H THEN 211
207 RESTORE S+T+N1-A:READ X$,Y,ZZ:IF G
P-Y<O THEN 210
208 FOR II=H TO I:IF E(II)<>O THEN NEX
T II
209 GP=GP-Y:E(II)=N1+T-A:W=W+A:? "'O.K
.'":? "'YOU HAVE ";GP;" GP CREDITS LEF
T.'":F2=A:GOSUB 500:GOTO 211
210 GOSUB 629
211 GOSUB 627:GOTO 201
213 ? "THE MAID LEAVES YOU...":RETURN
270 ? "THE BLACKSMITH ASKS 'DO YOU WAN
T    ARMOR OR WEAPONS'(Y/N)";:INPUT C$
:IF C$="N" THEN 285
271 ? "HE SHOWS YOU A LIST."
```

continued on next page

```
272 ? :? "ARMOR & WEAPONS":GOSUB 5
277 TRAP 285:INPUT T:IF T<A OR T>G THE
N 277
278 IF W=H THEN 283
279 RESTORE S+T:READ X$,Y:IF GP-Y<0 TH
EN 281
280 GP=GP-Y:E(T)=E(T)+A:W=W+A:? "'O.K.
'":? "'YOU HAVE ";GP;" GP CREDITS LEFT
.'":GOTO 283
281 GOSUB 629
283 GOSUB 627:GOTO 272
285 ? "HE LEAVES YOU...":RETURN
300 ? :? "N  NORTH":? "S  SOUTH":? "E
 EAST":? "W  WEST":? "X  EXAMINE":? "G
 GET":? "D  DROP"
305 ? "I  INVENTORY & STATUS":? "F  ??
??":? "A  ATTACK WITH SWORD/SPEAR":? "
T  THROW SPEAR"
310 ? "FP FIRE POISON ARROW":? "FS FIR
E SILVER ARROW":? "ET EAT":? "DK DRINK
":? "QT QUIT":? "SG SAVE"
315 RETURN
340 IF TM(L,D)=0 THEN 353
341 ? "YOU'RE UNDER ATTACK!":AC=G+SAC:
IF E(G)>0 THEN AC=AC-A
342 Z=0:FOR X=E TO F:IF E(X)>0 THEN Z=
(X-5)*B
344 NEXT X:AC=AC-Z
346 RESTORE R+TM(L,C):READ X$,MH,MAC,M
A,MD:X=I-AC-MH:FOR Y=A TO INT(RND(0)*M
A)+A
348 IF INT(RND(0)*I)+A+SCD<X THEN ? "C
RUNCH! A GLANCING BLOW!":GOTO 352
349 ? "OW! YOU'VE BEEN HURT!":HP=HP-(I
NT(RND(0)*MD)+A):? "HIT POINTS LEFT: "
;HP
350 IF HP<A THEN ? "*YOU'RE DEAD.*":FO
R X=A TO J:NEXT X:POP :GOTO 601
352 NEXT Y
353 RETURN
360 MX$=M$:X=0:IF INT(RND(0)*(CI+SCI)/
B)>0 THEN 370
362 FOR Y=A TO D:IF M$(Y,Y)<>"0" THEN
X=X+A
363 NEXT Y:IF X=0 THEN 370
366 FOR Y=A TO INT(RND(0)*X)+A
367 Z=INT(RND(0)*D)+A:IF MX$(Z,Z)="0"
THEN 367
369 MX$(Z,Z)="0":NEXT Y
370 ? "YOU CAN MOVE: ";
371 FOR DR=A TO D:IF MX$(DR,DR)="0" TH
EN 377
372 ON DR GOTO 373,374,375,376
373 ? " N ";:GOTO 377
374 ? " S ";:GOTO 377
375 ? " E ";:GOTO 377
376 ? " W";
377 NEXT DR
378 IF MX$="0000" THEN ? "NOWHERE";
379 ? " ":RETURN
380 GOSUB 400:GOSUB 420:GOSUB 360:RETU
RN
400 F1=0:T1$="":T2$="":V1=0:V2=0:Z1=0:
Z2=0
402 IF TM(L,A)<>0 AND INT(RND(0)*(C+SC
W))>0 THEN RESTORE S+TM(L,A):READ T1$,
V1,Z1:? "OBJECTS: ";T1$:F1=A
403 IF TM(L,B)<>0 AND INT(RND(0)*(C+SC
W))>0 THEN RESTORE S+TM(L,B):READ T2$,
V2,Z2:? "OBJECTS: ";T2$:F1=F1+B
404 IF F1=0 THEN ? "OBJECTS: NONE":GOT
O 407
405 IF INT(RND(0)*((CW+SCW)/C))=0 THEN
 407
406 IF Z1+Z2>0 THEN ? "BEWARE OF THE O
BJECTS!"
407 RETURN
420 ? "MONSTERS: ";:IF TM(L,D)=0 THEN
? "NONE":GOTO 423
421 RESTORE R+TM(L,C):READ X$:GOSUB 49
0:? P;" ";X$;:IF P>A THEN ? "S"
422 IF P=A THEN ? ""
423 RETURN
430 IF TM(L,D)=0 THEN 420
431 WS=0:ON C1-G GOTO 432,435,437,437
432 MM=A:MN=A:IF W(A)>0 THEN WS=A:? "C
HOP!":GOTO 442
433 IF E(A)+E(B)=0 THEN GOSUB 449:? "S
WORDS OR SPEARS.":RETURN
434 ? "KILL!!!":GOTO 442
435 IF E(B)=0 THEN GOSUB 449:? "SPEARS
.":RETURN
436 MM=0.75:MN=1.5:X=B:Y=B:GOSUB 539:?
 "SWISH!":GOTO 442
437 IF E(C)=0 THEN GOSUB 449:? "BOW.":
RETURN
438 IF C1-G=C AND E(D)=0 THEN GOSUB 44
9:? "POISON ARROWS.":RETURN
439 IF C1-G=C THEN MM=0.5:MN=1.5:X=D:Y
=D:GOSUB 539:? "TWANG!":GOTO 442
440 IF E(5)=0 THEN GOSUB 449:? "SILVER
 ARROWS.":RETURN
441 MM=0.5:MN=0.75:X=5:Y=5:WS=WS+B:GOS
UB 539:? "TWANG!"
442 RESTORE R+TM(L,C):READ X$,MH,MAC,M
A,MD,MS
443 ON MS GOTO 444,445,447,448
444 GOSUB 670:RETURN
445 IF WS=A OR WS=C THEN GOSUB 670:RET
URN
446 GOTO 448
447 IF WS=B OR WS=C THEN GOSUB 670:RET
URN
448 ? "NO EFFECT.":RETURN
449 ? "YOU HAVE NO ";:RETURN
450 ? "INVENTORY":? :? GP;" GP CREDITS
":FOR X=A TO I:IF E(X)=0 THEN 455
452 Z=E(X):Y=X:IF X>G THEN Y=E(X):Z=A
453 RESTORE S+Y:READ X$:? Z;" ";X$;:IF
 Z>A THEN ? "S"
454 IF Z=A THEN ? " "
455 NEXT X
457 ? :? "HIT POINTS":? :? HP;" HIT PO
INTS (";:? INT(HP*J/OLDHP);"% OF TOTAL
)":RETURN
470 GOSUB 627:IF W=H THEN 482
472 ? "GET WHAT";:INPUT X$:IF X$="" TH
EN 472
473 IF X$<>T1$ AND X$<>T2$ THEN ? "IT'
S NOT HERE.":GOTO 482
474 ? "GOT IT.":IF X$=T1$ THEN X=TM(L,
A):TM(L,A)=0:T1$="":F1=F1-A
475 IF X$=T2$ THEN X=TM(L,B):TM(L,B)=0
:T2$="":F1=F1-B
476 IF X<H THEN E(X)=E(X)+A:W=W+A:GOTO
 481
477 RESTORE S+X:READ X$,Z,ZZ:IF ZZ=A T
HEN 482
478 IF ZZ>A THEN F2=A:F3=0:GOSUB 500:I
F F3=A THEN 476
479 FOR Y=H TO I:IF E(Y)=0 THEN E(Y)=X
:W=W+A:GOTO 481
480 NEXT Y
481 GOSUB 627
```

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482 RETURN
490 P=INT(TM(L,D)):IF INT(TM(L,D)*J)-P
*J>0 THEN P=P+A
491 RETURN
500 TRAP 501:GOSUB 500+ZZ:RETURN
501 POP :RETURN
502 VX=X-I:S(VX)=S(VX)+F2:RETURN
505 VX=X-24:S(VX)=S(VX)+F2*H:RETURN
506 F3=A:X=INT(RND(0)*67)+A:IF X=44 TH
EN 506
507 RETURN
508 SCW=SCW+J*F2:RETURN
509 SCW=SCW-J*F2:RETURN
510 SCI=SCI+J*F2:RETURN
511 SCI=SCI-J*F2:RETURN
512 W(A)=W(A)+F2:SCS=SCS-F2:RETURN
513 SAC=SAC+J*F2:RETURN
514 W(A)=W(A)+F2:SCS=SCS+F2:RETURN
517 SAC=SAC-J*F2:RETURN
518 F(A)=F(A)+F2:RETURN
519 F(B)=F(B)+F2:RETURN
520 IF F2=A THEN HP=HP-INT(RND(0)*OLDH
P):GOSUB 624
521 RETURN
522 IF F2=-A THEN X1=OX:Y1=OY:GOTO 526
523 RETURN
524 IF F2=-A THEN X1=19:Y1=H:GOTO 526
525 RETURN
526 POP :POP :? "TELEPORTED!":GOTO 90
530 ? "DROP WHAT";:INPUT C$:IF C$="" T
HEN 530
532 FOR Y=A TO I:IF E(Y)=0 THEN 536
533 X=E(Y):IF Y<H THEN X=Y
534 RESTORE S+X:READ X$,Z,ZZ
535 IF X$=C$ THEN 538
536 NEXT Y
537 ? "YOU DON'T HAVE ONE.":GOTO 547
538 ? "THUD."
539 CT=0:IF TM(L,A)=0 THEN TM(L,A)=X:G
OTO 544
540 IF TM(L,B)=0 THEN TM(L,B)=X:GOTO 5
44
541 Z1=INT(RND(0)*A1)+A:IF TM(Z1,A)=0
THEN TM(Z1,A)=X:GOTO 544
542 IF TM(Z1,B)=0 THEN TM(Z1,B)=X:GOTO
 544
543 CT=CT+A:IF CT<H THEN 541
544 W=W-A:IF Y<H THEN E(Y)=E(Y)-A:GOTO
 547
545 E(Y)=0:IF ZZ>A THEN F2=-A:GOSUB 50
0
547 RETURN
560 FOR Z=A TO D:IF M$(Z,Z)="0" THEN 5
72
562 IF INT(RND(0)*CH/C)>0 THEN 572
563 X=0:Y=0:ON Z GOTO 564,565,566,567
564 Y=A:NR=B:GOTO 568
565 Y=-A:NR=A:GOTO 568
566 X=A:NR=D:GOTO 568
567 X=-A:NR=C
568 RESTORE K+J*(X1+X)+Y+Y1:READ L1,X$
:IF TM(L1,D)=0 OR X$(NR,NR)="0" THEN 5
72
569 IF TM(L,D)>0 AND TM(L,C)<>TM(L1,C)
 THEN 572
570 TM(L,C)=TM(L1,C):TM(L,D)=TM(L,D)+T
M(L1,D):TM(L1,C)=0:TM(L1,D)=0
571 IF TM(L,D)>0 THEN ? "INCOMING MONS
TERS!":GOSUB 420
572 NEXT Z
573 RETURN
580 OP=0:? :? "YOU HEAR A LOUD NOISE."
581 IF TM(L,D)=0 THEN OCH=CH:CH=0:GOSU
B 560:CH=OCH:GOTO 596
582 IF INT(RND(0)*(E+SG))=0 THEN 596
583 Y=0:IF OP>D THEN 596
584 Z=INT(RND(0)*D)+A:IF M$(Z,Z)<>"0"
THEN 587
585 Y=Y+A:IF Y>E THEN 596
586 GOTO 584
587 X=0:Y=0:ON Z GOTO 588,589,590,591
588 Y=A:GOTO 592
589 Y=-A:GOTO 592
590 X=A:GOTO 592
591 X=-A
592 RESTORE K+J*(X+X1)+(Y+Y1):READ Z:I
F TM(Z,C)<>0 AND TM(Z,C)<>TM(L,C) THEN
 OP=OP+A:GOTO 583
594 TM(Z,C)=TM(L,C):TM(Z,D)=TM(Z,D)+TM
(L,D):TM(L,C)=0:TM(L,D)=0:GOSUB 420
596 RETURN
601 FOR II=A TO G:RESTORE S+II:READ X$
,Y:GP=GP+E(II)*Y:NEXT II
602 FOR II=H TO I:IF E(II)>0 THEN REST
ORE S+E(II):READ X$,Y:GP=GP+Y
603 NEXT II:? :? "YOUR WEAPONS AND TRE
ASURES HAVE ALL BEEN SOLD."
614 GP=INT(GP):EP=EP+GP:EP=INT(EP*CS/G
):OLDLL=LL:LL=LL+INT(EP/C/J)
615 GOSUB 640:GOSUB 630:? :? "EXPERIEN
CE POINTS: ";EP:? :? "LEVEL: ";LL
617 ? :? "START OVER WITH THIS CHARACT
ER(Y/N)";:INPUT C$:IF C$="N" THEN END
620 GOSUB 750:GOSUB 640:IF LL>OLDLL TH
EN GOSUB 759:GOTO 64
621 HP=OLDHP:GOTO 64
624 IF HP<A THEN POP :POP :POP :GOTO 3
50
625 RETURN
627 IF W=H THEN ? "YOU CAN'T CARRY ANY
MORE."
628 RETURN
629 ? "'YOU HAVE ";GP;" GP CREDITS LEF
T.'":? "'YOU DON'T HAVE ENOUGH GOLD.'"
:RETURN
630 ? :? "HIT POINTS : ";HP:? :? "GOLD
 PIECES : ";GP:RETURN
640 ? :? "CHARACTER TRAITS":? :? "STRE
NGTH.......";CS:? "INTELLIGENCE...";CI
:? "INTUITION......";CW
641 ? "CONSTITUTION...";CO:? "SPEED...
.......";CD:? "VISAGE.........";CH:RET
URN
660 IF MX$(C1,C1)="0" THEN ? "YOU CAN'
T.":C2=A:GOTO 667
661 X=0:Y=0:ON C1 GOTO 662,663,664,665
662 Y=A:GOTO 666
663 Y=-A:GOTO 666
664 X=A:GOTO 666
665 X=-A
666 X1=X1+X:Y1=Y1+Y:C2=B
667 RETURN
670 X=INT((19-MAC-(CD+SCD)/D)*MM):IF I
NT(RND(0)*I)+A<X THEN ? "YOU MISSED!":
GOTO 678
671 ? "A HIT!":Y=INT(RND(0)*(E+CS/H+SC
S)*MN)+A:IF Y<A THEN Y=INT(RND(0)*C)+A
672 Z=Y/MH:IF Z>A THEN Z=A
673 GOSUB 490:OP=P:TM(L,D)=TM(L,D)-Z:I
F TM(L,D)<0.01 THEN TM(L,D)=0
674 GOSUB 490:GOSUB 420:? "MONSTER TYP
E'S HIT DICE: ";MH:? "POINTS OF DAMAGE
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 DONE: ";Y
675 IF OP>P THEN ? "YOU KILLED THE ";X
$;"!":EP=EP+MH^B*F:GOTO 678
676 ? "YOU WOUNDED THE ";X$;"."
678 RETURN
680 ? "THE PAWNBROKER ASKS,'YOU WANNA
SELL SOMETHING'(Y/N)";:INPUT C$:IF C$=
"N" THEN 699
681 ? "SELL WHAT";:INPUT C$:IF C$="" T
HEN 681
682 FOR Y=A TO I:IF E(Y)=0 THEN 686
683 X=E(Y):IF Y<H THEN X=Y
684 RESTORE S+X:READ X$,Z,ZZ
685 IF X$=C$ THEN 688
686 NEXT Y
687 ? "'YOU DON'T HAVE ONE.'":GOTO 698
688 Z=Z-INT(RND(0)*Z*0.4):IF Z=0 THEN
? "'I CAN'T USE THAT.'":GOTO 698
689 ? "'I'LL GIVE YOU ";Z;" GOLD PIECE
S":? "FOR IT.'(Y/N)";:INPUT C$
690 ? "'O.K.'":IF C$<>"Y" THEN 698
691 GP=GP+Z:W=W-A:IF Y<H THEN E(Y)=E(Y
)-A:GOTO 697
692 E(Y)=0:IF ZZ>A THEN F2=-A:GOSUB 50
0
697 ? "'YOU GOT A TOTAL OF ";GP;" CRED
ITS.'"
698 ? "'ANYTHING ELSE TO SELL'(Y/N)";:
INPUT C$:IF C$<>"N" THEN 681
699 GOTO 285
750 ? :? "INITIALIZING...":W=0:SCS=0:S
AC=0:SCW=0:SCI=0:SCD=0:EP=0:CN=A:FC=30
:DC=I:SG=0
751 X1=OX:Y1=OY:FOR X=A TO I:E(X)=0:NE
XT X:RESTORE K
752 TRAP 754:READ X,X$,X$,X$
753 TM(X,A)=ASC(X$(A,A)):TM(X,B)=ASC(X
$(B,B)):TM(X,C)=ASC(X$(C,C)):TM(X,D)=A
SC(X$(D,D)):GOTO 752
754 F(A)=0:F(B)=0:W(A)=0:FOR II=A TO D
:S(II)=0:NEXT II
757 ? "⇱";:RETURN
759 T=F:U=LL:GOSUB C:HP=V:IF CO=Q THEN
 HP=HP*D
761 IF CO=17 THEN HP=HP*C
762 IF CO=15 OR CO=16 THEN HP=HP*B
763 IF CO<7 THEN HP=LL
764 RETURN
801 DATA BLACK ORC,7,7,1,5,1
802 DATA SKELETON,5,6,1,5,3
803 DATA MAMMOTH,12,5,2,8,1
804 DATA SABER TOOTH TIGER,11,5,2,7,1
805 DATA MONK,6,7,1,3,1
806 DATA MONK-EY,4,4,1,2,1
807 DATA RAINBOW WORM,16,7,1,8,1
808 DATA METAL STATUE,9,0,1,7,1
809 DATA ORC CHIEFTAIN,8,6,1,5,1
810 DATA FOUR-HEADED HYDRA,24,4,4,6,2
811 DATA SILVER DRAGON,40,1,3,9,1
812 DATA HORRID WES-LEY,1,1,1,1,4
813 DATA CEREBUS,19,5,3,6,1
814 DATA NASTY DOGGIE,4,5,1,3,1
815 DATA LAVA TROLL,9,0,1,6,4
816 DATA VAMPIRE BAT,2,1,2,1,1
817 DATA WALKING PIRANHA,2,0,3,2,1
818 DATA WERE-BEAR,13,5,1,5,3
819 DATA WERE-WOLF,9,4,1,6,3
820 DATA WERE-RABBIT,6,3,1,7,3
821 DATA SILVER KNIGHT,8,1,1,6,1
822 DATA IGOR,6,6,1,4,1
823 DATA GHOULISH DEMON,9,5,1,6,2
824 DATA RUBBER KNIGHT,8,1,1,6,2
825 DATA WRAITH,7,4,1,3,3
826 DATA CYCLOPS,15,5,1,7,1
827 DATA FOOT-SOLDIER,6,6,1,4,1
828 DATA LOCH NESS MONSTER,14,4,1,6,1
829 DATA TOAD,3,2,1,1,1
830 DATA BOA CONSTRICTOR,5,4,1,2,1
831 DATA WHITE UNICORN,13,4,3,7,2
832 DATA OSTRICH,5,5,1,3,1
833 DATA WOOD GNOME,9,4,1,7,3
834 DATA SKELETAL HORSE,9,4,2,5,3
835 DATA SUNDAY DRIVER,6,6,1,4,1
836 DATA DINOSAUR,20,3,1,8,1
837 DATA CYBERNETIC TANK,999,0,6,50,
838 DATA LAND-SEA SHARK,7,4,1,7,1
844 DATA 59,54,71,73,58,71,60,54,72
901 DATA PLAIN SWORD,15,0
902 DATA SPEAR,17,0
903 DATA LONG BOW,20,0
904 DATA POISON ARROW,2,0
905 DATA SILVER ARROW,5,0
906 DATA LEATHER ARMOR,20,0
907 DATA CHAIN MAIL,30,0
908 DATA PLATE ARMOR,40,0
909 DATA IRON SHIELD,10,0
910 DATA RADIUM STATUETTE,26,0
911 DATA GOLD NUGGET,12,0
912 DATA IVORY DRAUGHTS SET,42,0
913 DATA GOLD BAR,46,0
914 DATA POT OF GOLD,33,0
915 DATA BAG OF SILVER,17,0
916 DATA CASKET OF GEMS,66,0
917 DATA DEAD ATARI 400,40,6
918 DATA FIRESTONE,50,0
919 DATA BAG OF ORICHALCS,100,0
920 DATA BLACK PEARL NECKLACE,15,0
921 DATA BLUE SPHERE,5,2
922 DATA RED PYRAMID,5,2
923 DATA YELLOW CUBE,5,2
924 DATA GREEN BOX,5,2
925 DATA FIRESTONE,50,5
926 DATA AMETHYST,50,5
927 DATA RUBY,50,5
928 DATA TOPAZ,50,5
929 DATA BLUE HOPE DIAMOND,75,0
930 DATA SILLY PUTTY,1,6
931 DATA CANNONBALL,9,0
932 DATA BATS BREATH,6,6
933 DATA CHARIOT WHEEL,25,0
934 DATA FLAMING DRAGON SWORD,25,14
935 DATA WHITE HAIR,0,8
936 DATA BLACK WOOD SPEAR,19,1
937 DATA 16K GOLD CHIP,13,0
938 DATA CRACKED CLAY PITCHER,0,20
939 DATA GREEN ORB,29,9
940 DATA JADE NECKLACE,33,13
941 DATA PHILOSOPHERS STONE,7,1
942 DATA 7 LAYERED SHIELD,15,17
943 DATA IRON PINCERS,3,0
945 DATA SUNKINGS CROWN,70,11
946 DATA CUNYS SKULL,0,10
947 DATA ROCK,0,18
948 DATA KNISH,4,18
949 DATA STEW,5,18
950 DATA MUTTON,6,18
951 DATA PORK CHOPS,7,18
952 DATA STEAK,8,18
953 DATA CIDER,4,19
954 DATA ALE,5,19
955 DATA WINE,6,19
956 DATA MEAD,7,19
957 DATA LEADEN LIQUID,33,19
958 DATA SACK OF MAGIC BEANS,2,18
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959 DATA PUDDLE,0,19
960 DATA DOM PERIGNON,4,19
961 DATA MERCURY PUDDLE,1,19
962 DATA FUNGUS BREAD,0,18
963 DATA FORBIDDEN FRUIT,2,18
964 DATA OSTRICH MCNUGGET,0,18
965 DATA YELLOW RIBBON,5,18
966 DATA ROCK,0,0
967 DATA PEBBLE,0,6
968 DATA DOUGHNUT HOLE,0,22
969 DATA CUTLASS,20,12
970 DATA SILVER OVOID,15,24
971 DATA HONDA,100,0
972 DATA PLUMED HELMET,18,0
999 DATA N,S,E,W,X,G,D,I,F,A,T,FP,FS,E
T,DK,QT,SG
1000 IF L=73 THEN N1=A:N2=G:GOSUB 270:
RETURN
1001 IF L=89 THEN GOSUB 680:RETURN
1002 IF L=58 THEN HP=OLDHP:N1=48:N2=G:
GOSUB 199:RETURN
1008 IF L=136 AND TM(134,D)+TM(136,D)<
A THEN GOSUB 1300:POP :C1=16:GOTO 601
1050 RETURN
1100 IF F(A)<A THEN ? "YOU HAVE NO FOO
D.":GOTO 1199
1105 ? "EAT WHAT";:INPUT C$:IF C$="" T
HEN 1105
1106 FOR X=H TO I:IF E(X)=0 THEN 1111
1109 Y=E(X):RESTORE S+Y:READ X$,Z,ZZ
1110 IF X$=C$ THEN 1113
1111 NEXT X
1112 ? "YOU DON'T HAVE ONE.":GOTO 1199
1113 IF Y=58 THEN HP=OLDHP:SG=E
1114 IF Y=63 THEN ? "SINNER!":GOTO 112
0
1115 IF Y=62 THEN ? "YEECH! TASTES LIK
E POISON!":HP=0:GOTO 350
1118 IF ZZ=Q THEN FC=CN+Y:JX=A:GOTO 11
20
1119 ? "YOU CAN'T EAT THAT.":GOTO 1199
1120 F(JX)=F(JX)-A:E(X)=0:W=W-A
1130 ? "AAHHH! THAT WAS SO,SO GOOD!"
1199 RETURN
1200 IF F(B)<A THEN ? "YOU HAVE NO DRI
NK.":GOTO 1299
1205 ? "DRINK WHAT";:INPUT C$:IF C$=""
 THEN 1205
1206 FOR X=H TO I:IF E(X)=0 THEN 1211
1209 Y=E(X):RESTORE S+Y:READ X$,Z,ZZ
1210 IF X$=C$ THEN 1213
1211 NEXT X
1212 ? "YOU DON'T HAVE ONE.":GOTO 1299
1213 IF Y=61 THEN ? "GURGLE,GURGLE.":H
P=0:GOTO 350
1214 IF Y=57 THEN HP=OLDHP
1216 IF ZZ=19 THEN DC=CN+Y-23:JX=B:GOT
O 1120
1219 ? "YOU CAN'T DRINK THAT.":GOTO 12
99
1299 RETURN
1300 ? :? "THE WALLS BEGIN TO GLOW. SU
DDENLY,  FIERY RUNES APPEAR IN THE AIR
!!!!":?
1301 RESTORE 844:QK=E:GOSUB 1304:? " I
S YOUR NAME AND ";:QK=C:GOSUB 1304:? :
? "IS THE SECRET OF YOUR POWER!"
1303 ? :FOR X=A TO J:NEXT X:RETURN
1304 FOR II=A TO QK:READ X:X=X+S(B):?
CHR$(X);:NEXT II:RETURN
1600 IF S(C)/B<>INT(S(C)/B) AND S(A)<H
 THEN GOSUB 1650:GOTO 1660
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1610 IF TM(A,D)+TM(B,D)>0 THEN GOTO 16
50
1620 IF S(A)<A THEN GOTO 1650
1635 GOSUB 3000
1639 IF LEN(C$)<>E THEN 1649
1640 IF C$(E,E)<>CHR$(80) THEN 1649
1645 RETURN
1649 ? "'GNORW!'"
1650 ? "A BLUE FORCE FIELD PUSHES YOU
BACK!":X1=X1+A:RETURN
1660 ? "THE GUARDIAN RIPS YOU TO SHRED
S!"
1661 HP=0:POP :GOTO 350
1800 IF S(D)/B<>INT(S(D)/B) AND S(B)<H
 THEN GOSUB 1850:GOTO 1660
1810 IF TM(53,D)+TM(68,D)+TM(84,D)+TM(
67,D)>0 THEN GOTO 1850
1820 IF S(A)<H OR S(B)<A THEN GOTO 185
0
1835 GOSUB 3000
1839 IF LEN(C$)<>E THEN 1849
1840 IF C$(5,5)<>CHR$(90) THEN 1849
1845 RETURN
1849 ? "'GNORW!'"
1850 ? "A RED FORCE FIELD SLAMS YOU BA
CK!":X1=X1+A:RETURN
2000 IF L=1 THEN GOSUB 1600:RETURN
2002 IF L=67 THEN GOSUB 1800:RETURN
2004 IF L=135 THEN GOSUB 2100:RETURN
2006 IF L=48 THEN GOSUB 2200:RETURN
2050 RETURN
2100 IF S(A)+S(B)+S(C)+S(D)=44 THEN ?
"TELEPORTED!":X1=X1-A:RETURN
2101 IF S(A)/B<>INT(S(A)/B) AND S(C)<H
 THEN GOSUB 2150:GOTO 1660
2110 IF TM(131,D)+TM(135,D)>0 THEN GOT
O 2150
2120 IF S(A)+S(B)<I OR S(C)<A THEN GOT
O 2150
2135 GOSUB 3000
2140 IF LEN(C$)<>D THEN 2149
2141 IF C$(D,D)<>CHR$(80) THEN 2149
2145 RETURN
2149 ? "'GNORW!'"
2150 ? "A YELLOW FORCE FIELD SHOVES YO
U BACKVIOLENTLY!":Y1=Y1+A:RETURN
2200 IF S(B)/B<>INT(S(B)/B) AND S(D)<H
 THEN GOSUB 2250:GOTO 1660
2210 IF TM(48,D)+TM(47,D)>0 THEN GOTO
2250
2220 IF S(A)+S(B)+S(C)<30 OR S(D)<A TH
EN GOTO 2250
2235 GOSUB 3000
2239 IF LEN(C$)<>5 THEN 2249
2240 IF C$(C,C)<>CHR$(76) THEN 2249
2245 RETURN
2249 ? "'GNORW!'"
2250 ? "A GREEN FORCE FIELD CRUSHES YO
UR FACE AND PUSHES YOU BACK!":X1=X1-A:
RETURN
2900 CN=CN-A:TRAP 2914:GOSUB 2950:IF X
$="D" THEN ? :? "INSERT DISK. PRESS RE
TURN";:INPUT X$:GOTO 2905
2904 ? :? "POSITION TAPE. PRESS RECORD
 & PLAY, THEN RETURN."
2905 X$=CHR$(155):OPEN #A,F,0,C$
2906 ? #A;X1;X$;Y1;X$;LL;X$;CS;X$;CI;X
$;CW;X$;CO;X$;CH;X$;SG
2907 ? #A;CD;X$;OLDHP;X$;HP;X$;GP;X$;E
P;X$;W(A);X$;F(A);X$;F(B)
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2908 ? #A;W;X$;CN;X$;FC;X$;DC;X$;SCS;X
$;SAC;X$;SCW;X$;SCI;X$;SCD
2909 FOR X=A TO D:? #A;S(X):NEXT X:FOR
 X=A TO I:? #A;E(X):NEXT X
2911 FOR X=A TO A1:FOR Y=A TO D:? #A;T
M(X,Y):NEXT Y:NEXT X
2912 CLOSE #A:? :? "◘DONE.":RETURN
2914 CLOSE #A:? :? "◘ERROR.":RETURN
2920 TRAP 2930:IF X$="D" THEN ? :? "IN
SERT DISK. PRESS RETURN";:INPUT X$:GOT
O 2924
2921 ? :? "POSITION TAPE. PRESS PLAY,
THEN      RETURN."
2924 OPEN #A,D,O,C$:INPUT #A;X1,Y1,LL,
CS,CI,CW,CO,CH,SG
2925 INPUT #A;CD,OLDHP,HP,GP,EP,X,Y,Z:
W(A)=X:F(A)=Y:F(B)=Z
2926 INPUT #A;W,CN,FC,DC,SCS,SAC,SCW,S
CI,SCD:CN=CN+A
2927 FOR X=A TO D:INPUT #A;Y:S(X)=Y:NE
XT X:FOR X=A TO I:INPUT #A;Y:E(X)=Y:NE
XT X
2929 FOR X=A TO A1:FOR Y=A TO D:INPUT
#A;Z:TM(X,Y)=Z:NEXT Y:NEXT X:GOTO 2912
2930 GOSUB 2914:POP :GOTO 15
2950 ? :? "CASS/DISK(C/D)";:INPUT X$:C
$="C:":IF X$="D" THEN C$="D:AI.DAT"
2951 RETURN
3000 ? "THE VOICE OF THE GUARDIAN HISS
ES,":? "'TAHW SI EHT KIGAM DRUW'";:INP
UT C$:RETURN
10513 DATA 67,OOEO,ALTAR-STONE SLAB UP
HELD ON A DAIS BYKNEELING CHERUBS..←└♥
♥
10612 DATA 84,NOEO,H,♥;┤├
10613 DATA 68,NSOW,HALL OF STONED GIAN
TS. TO THE WEST  IS A RED GLOW.,♥▄ ♥♥
10614 DATA 53,OSEO,H,♥/┘├
10711 DATA 97,NOEO,H,♥♥┐┤
10712 DATA 85,NSOW,H,♥♥┐◢
10713 DATA 69,NSOO,DOME-SHAPED ROOM. A
 HOT AMBER SPHEREFLOATS NEAR THE ROOF
EMITTING RAYS.,B(♥♥
10714 DATA 54,NSOW,H,♥♥┐◢
10715 DATA 42,OSEO,H,♥B┐┤
10720 DATA 166,OOEO,O,♥♥&▪
10721 DATA 169,OSEO,PIRATE FRIGATE,♣E▕
▕
10808 DATA 163,NOEO,M,♥B♥♥
10809 DATA 160,OSEO,AHZ FISSION BOMB C
RATER               EVERYTHING SHINES!,‾
▪▌├
10810 DATA 101,NOEO,C,♥B/┐
10811 DATA 98,NSEW,H,♥♥♥♥
10812 DATA 86,NSEO,H,♥♥/┐
10813 DATA 70,NSEO,H,♥‾◢├
10814 DATA 55,NSEO,H,♥‾/┐
10815 DATA 43,NSEW,H,<<♥♥
10816 DATA 28,OSEO,C,♥♥/┐
10820 DATA 165,OOEW,M,♥_♥♥
10821 DATA 168,NOOW,P,♥♥♥♥
10822 DATA 171,OSEO,P,♥C♥♥
10908 DATA 162,NOEW,M,""♥♥
10909 DATA 159,OSEW,A,♥♥♥♥
10910 DATA 102,NOOW,C,♥♥┐┘
10911 DATA 99,NSOW,C,/;/┐
10912 DATA 87,NSOW,C,♥/◢├
10913 DATA 71,NSEW,C,♥◣♥♥
10914 DATA 56,NSOW,C,♥▄◢├
10915 DATA 44,NSOW,C,♥♥/┐
10916 DATA 29,OSOW,C,B▄┐┘
10920 DATA 164,NOEW,ROCKY ROAD,♥;♥♥
10921 DATA 167,NSOO,CLIFF OVERLOOKING
THE SHINING SEA,♥♥♥♥
10922 DATA 170,OOOW,O,♥♥&┘
11008 DATA 161,NOOW,M,♥♥♥♥
11009 DATA 158,NSOW,A,C/▕├
11010 DATA 157,NSOO,A,♥♥♥♥
11011 DATA 156,NSOO,A,♥;♥♥
11012 DATA 155,NSOO,A,♥B▕├
11013 DATA 72,NSEW,SIGN READS 3 MILES
TO THE TEMPLE OF SEZEEN.,=/♥♥
11014 DATA 138,NSEO,SMALL ILL-KEPT CEM
ETARY. MUSHROOMS  ABOUND HERE.,♥▁▌▕
11015 DATA 137,NSOO,L,;/♥♥
11016 DATA 30,NSEO,F,;→♥♥
11017 DATA 23,NSOO,F,B/─├
11018 DATA 17,NSOO,F,♥♥┼├
11019 DATA 11,NSOO,F,♥♥●├
11020 DATA 5,OSOW,N,♣_♥♥
11106 DATA 127,NOEO,K,♥;♥♥
11107 DATA 121,NSOO,K,♥▄\├
11108 DATA 115,OSOO,K,♥♥♥♥
11109 DATA 109,NSEO,K,;/├├
11110 DATA 103,OSEO,K,♥/♥♥
11112 DATA 88,NOEO,STRAW COTTAGES,B;♥♥
11113 DATA 73,NSEW,TWO EYE'S BLACKSMIT
H SHOP,♥♥♥♥
11114 DATA 57,OSEW,LACY MARBLE CATHEDR
AL,♥♥♥♥
11116 DATA 31,OOEW,F,♥♥♥♥
11117 DATA 24,NOEO,STABLES. (PHEW!) TH
ERE IS A GIGANTICWOODEN HORSE HERE!,♥/
♥♥
11118 DATA 18,NSEO,SOUTHWEST TURRET ,♥
♥♥♥
11119 DATA 12,NSEO,GUARDS' ROOMS,♥♥ᵉ┐
11120 DATA 6,OSEO,NORTHEAST TURRET. TH
E SHINING SEA   CAN BE SEEN THRU A SLI
T WINDOW.,;"♥♥
11121 DATA 1,OOEO,TINY WHITE CUBICLE W
ITH NICE THICK  PADDING.,♥▌♥♥
11205 DATA 132,NOEO,J,♥"┌┌
11206 DATA 128,OSOW,J,♥/┌┘
11207 DATA 122,OOEO,ORC STORE ROOM,▁▄├
▕
11208 DATA 116,NOEO,ORC COMMON ROOM,;>
├┐
11209 DATA 110,OSOW,ORC GUARD ROOM,♥♥├
▪
11210 DATA 104,NOEW,DARK CAVERNOUS MOU
TH--THE ENTRANCE  TO THE CAVES!,←/"├
11211 DATA 100,NSOO,SIGN READS 5 MILES
 TO THE CAVES OF  PURB.,♥♥♥♥
11212 DATA 89,NSEW,THREE EYE'S PAWN SH
OP,♥♥♥♥
11213 DATA 74,NSEW,TOWN SQUARE OF THE
VILLAGE OF MAG.  A LAUGHING MAD MAN CR
IES 'BEWARE!'.,├♥♥♥
11214 DATA 58,NSEW,ONE EYE'S TAVERN,BD
♥♥
11215 DATA 45,NSEO,SIGN READS 3 MILES
TO THE CASTLE  OFPICCUH.,▄/▕├
11216 DATA 32,NSEW,OUTER GATE ROOM. TH
E 12-TON IRON    GATES ARE AJAR!,♥;▄├
11217 DATA 25,NSEW,INNER GATE ROOM. TH
E INDESTRUCTIBLE INNER GATES HAVE BEEN
 SHATTERED!,♥♥▕├
11218 DATA 19,NSEW,MAIN HALL. ON THE W
ALL IS AN ANCIENT TAPESTRY DEPICTING A
 BLACK SWIRLING WHIRLAXY,9&♥♥
11219 DATA 13,NSEW,SERVANTS' QUARTERS,
♥/┐├
11220 DATA 7,OSEW,EMPTY STORE ROOM. SP
```

```
IDERS AND SLUGS DRIP VENOMOUS VITRIOL
FROM THE       RAFTERS.,B♥♥♥
11221 DATA 2,OOEW,TORTURE CHAMBER. TO
THE WEST IS A   BLUE GLOW. A BROKEN SK
ELETON LIES    ON THE RACK.,+┬┘├
11302 DATA 134,NOEO,I,♥♥♥♥
11303 DATA 134,NSEO,I,♥♥♥♥
11304 DATA 134,OSEO,I,♥♥♥♥
11305 DATA 133,NOOW,J,♥"┌_
11306 DATA 129,OSEO,J,♥B┌
11307 DATA 123,NOOW,ORC CHIEFTAIN'S QU
ARTERS. ON THE     WALL IS A MURAL  OF
A PINK TROLL.,♥↓▪├
11308 DATA 117,OSEW,ORC LIVING QUARTER
S,♥♥┘
11309 DATA 111,NOEO,B,♥♥♥♥
11310 DATA 105,OSEW,B,♥;♥♥
11312 DATA 90,NOOW,BRICK COTTAGES,♥#♥♥
11313 DATA 75,NSEW,MARKET PLACE OF THE
 FOUR EYES,♥/♥♥
11314 DATA 59,OSOW,LOG CABINS,♥♥♥♥
11315 DATA 139,OOEW,L,♥/♥♥
11316 DATA 33,OOEW,F,♥♥♥♥
11317 DATA 26,NOOW,SOUTHEAST TURRET. Y
OU CAN SEE A      DENSE FOREST THRU THE
 WINDOW.,♥;♥♥
11318 DATA 20,NSOW,GUARDS' ROOMS,♥♥←┘
11319 DATA 14,NSEW,THE MINOR HALL. AN
EVIL VIOLET FLAMEGYRATES ON THE MANTLE
PLACE.,3—♥♥
11320 DATA 8,OSEW,LIVING QUARTERS. EVE
RYTHING IS       STRANGELY WARPED.,♥♥♥♥
11321 DATA 3,OOEW,DUNGEON. THE BARS AN
D SHACKLES ARE   ALL RUSTY AND CORRODED
 NOW.,♥♥ ┘
11402 DATA 136,NOEW,THE INFINIT CRYSTA
L ROOM,♥" ♥♥
11403 DATA 134,NSEW,I,♥♥♥♥
11404 DATA 134,NSEW,I,♥♥♥♥
11405 DATA 134,OSOO,I,♥♥♥♥
11406 DATA 130,NOEW,B,♥;_\
11407 DATA 124,NSOO,B,♥♥+←
11408 DATA 118,OSEW,B,♥;├|
11409 DATA 112,NOEW,B,♥♥♥♥
11410 DATA 106,OOOO,LAVA PIT. THERE SE
EMS TO BE NO WAY   OUT.,D'▪├
11413 DATA 76,OOEW,SIGN READS 3 MILES
TO THE FOREST OF ELBCH.,B;♥♥
11414 DATA 141,NOEO,L,B;♥♥
11415 DATA 140,OSOW,L,♥♥┐├
11416 DATA 34,NOOW,F,;!"┤
11417 DATA 27,NSOO,F,♥$♥♥
11418 DATA 21,OSEO,F,*◢♥♥
11419 DATA 15,NOOW,GUARD'S ROOMS,♥♥♥♥
11420 DATA 9,NSOW,VAULT & ARMORY,┌%┴├
11421 DATA 4,OSOW,SHORT ARCHED TUNNEL,
;▪+▬
11502 DATA 134,NOOW,I,♥♥♥♥
11503 DATA 134,NSOW,I,♥♥♥♥
11504 DATA 134,OSOW,I,;/"├
11505 DATA 135,NOOO,CHAMBER OF TEL-EPO
,/←♥♥
11506 DATA 131,OSOW,LEDGE IN FRONT OF
A YELLOW CHAMBER,♥♥‾├
11507 DATA 125,NOOO,B,♥▬♥♥
11508 DATA 119,OSOW,B,B/♥♥
11509 DATA 113,NOOW,B,♥‾♥♥
11510 DATA 107,OSEW,B,B;♥♥
11511 DATA 143,NOEO,L,♥♥♥♥
11512 DATA 142,NSOO,L,♥♥♥♥
11513 DATA 77,NSOW,D,♥/♥♥
11514 DATA 60,OSEW,D,♥;!├
11515 DATA 46,NOEO,E,♥♥←\
11516 DATA 35,OSEO,E,♥/↓‾
11518 DATA 22,NOOW,F,♥H♥♥
11519 DATA 16,NSOO,F,♥B♥♥
11520 DATA 10,OSOO,N,♥/♥♥
11607 DATA 126,NOOO,THE WIZARD'S SECRE
T ROOMS!, )┬├
11608 DATA 120,NSOO,DARKNESS. TO THE S
OUTH IS A LIGHT!,♥;♥♥
11609 DATA 114,NSOO,B,♥♥♥♥
11610 DATA 108,OSEW,B,/"♥♥
11611 DATA 144,OOEW,L,♥_←┤
11612 DATA 91,NOEO,G,-▪♥♥
11613 DATA 78,OSEO,G,♥.♥♥
11614 DATA 61,OOEW,WILD CRAB APPLE TRE
E ORCHARD,??←├
11615 DATA 47,OOEW,SWAMP. A GREENISH G
LOW EMANATES FROMTHE EAST.,♥♥♥♥
11616 DATA 36,OOEW,E,♥♥♥♥
11709 DATA 153,NOEO,L,♥♥♥♥
11710 DATA 154,NSOW,CAVE MOUTH,♥♥♥♥
11711 DATA 145,OOEW,TIME PORT #1,/;♥♥
11712 DATA 92,OOEW,G,♥♥♥♥
11713 DATA 79,OOEW,G,♥♥♥♥
11714 DATA 62,OOEW,D,♥♥♥♥
11715 DATA 48,OOOW,A BRACKISH SPRING B
UBBLES UP FROM A MOUND AT THE BASE OF
A TREE.,;↑◣├
11716 DATA 37,OOEW,E,♥B♥♥
11809 DATA 152,OOEW,L,♥♥♥♥
11810 DATA 150,OOOO,CRATERED NUCLEAR B
ATTLEFIELD,♥B%├
11811 DATA 146,OOEW,ASPHALT PARKING LO
T,♥G#├
11812 DATA 93,OOEW,G,♥♥♥♥
11813 DATA 80,NOOW,G,♥♥→├
11814 DATA 63,OSEW,D,♥♥♥♥
11815 DATA 49,NOEO,E,B/♥♥
11816 DATA 38,OSOW,E,♥♥♥♥
11909 DATA 151,OOOW,BACK GATE,♥♥♥♥
11910 DATA 148,NSEW,SILVER DOME. A SIG
N READS OPERATOR  REQUIRED FOR 2-WAY O
PS.,♥F♥♥
11911 DATA 147,OSOW,WIERD BUILDINGS. O
NE OF THEM IS      AN ANTI-MATTER POWER
 PLANT.,♥♥♥♥
11912 DATA 94,NOOW,G,B:♥♥
11913 DATA 81,NSOO,G,♥;→├
11914 DATA 64,OSEW,D,C/←"
11915 DATA 50,NOEW,IMMENSE BLUE LAKE C
OVERED BY BLACK   SWANS.,;●↑├
11916 DATA 39,OSEO,D,♥♥♥♥
12010 DATA 149,OOOO,PRIMEVAL RAIN-FORE
ST,♥┴$├
12012 DATA 95,NOEO,A BROKEN CIRCLE OF
STANDING STONES,♥; ┐
12013 DATA 82,NSOO,FIELD OF SUNFLOWERS
,♥B♥♥
12014 DATA 65,NSOW,D,♥┤ ♥♥
12015 DATA 51,OSEW,D,♥♥♥♥
12016 DATA 40,OOEW,D,♥♥♥♥
12112 DATA 96,NOOW,MEADOW OF EAT-YOU-A
LIVE FLOWERS,@"♥♥
12113 DATA 83,NSOO,MONOLITHIC STONE RU
INS,‾‾ \
12114 DATA 66,NSOO,FIELD OF WHITE MOON
FLOWERS,♥♥♥♥
12115 DATA 52,OSOW,D,/▪ ♥♥
12116 DATA 41,OOOW,AN OLD OAK TREE CAS
```

continued on next page

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TS A DAPPLED      SHADOW OVER A QUIET G
LADE.,+A! I
```

TYPO TABLE

Variable checksum = 2879836

Line num range	Code	Length
0 - 10	LM	604
12 - 20	DW	528
40 - 96	DV	486
97 - 110	FY	459
111 - 153	JC	391
154 - 209	UT	540
210 - 283	NU	431
285 - 346	JH	507
348 - 370	PZ	399
371 - 402	ET	348
403 - 432	TK	426
433 - 442	TF	504
443 - 455	HM	325
457 - 481	DA	466
482 - 510	LM	263
511 - 524	PA	261
525 - 540	CR	297
541 - 566	MD	379
567 - 584	OE	414
585 - 602	GD	388
603 - 630	OL	523
640 - 671	FQ	501
672 - 685	EE	469
686 - 750	FT	501
751 - 802	NN	387
803 - 814	WC	333
815 - 826	LE	316
827 - 838	DO	339
844 - 911	MQ	271
912 - 923	JQ	286
924 - 935	CR	255
936 - 948	XL	284
949 - 960	YB	224
961 - 972	MT	263
999 - 1111	TL	407
1112 - 1206	ZE	419
1209 - 1303	NJ	459
1304 - 1661	EK	345
1800 - 2004	NM	381
2006 - 2150	NZ	371
2200 - 2905	ZE	481
2906 - 2926	YY	513
2927 - 10712	QH	507
10713 - 10814	JC	381
10815 - 10914	RM	246
10915 - 11014	SW	379
11015 - 11112	GM	258
11113 - 11208	QE	503
11209 - 11217	RS	548
11218 - 11307	PU	531
11308 - 11320	TY	501
11321 - 11414	ZA	414
11415 - 11506	TJ	337
11507 - 11519	EM	246
11520 - 11709	OK	375
11710 - 11813	YX	373
11814 - 12010	BI	432
12012 - 12116	NQ	388

game of the month

ADVENT X-5

LISTING 1

```
1 REM ADVENT X-5
2 REM BY J.D. CASTEN
3 REM ANTIC MAGAZINE
5 Z=0:O= NOT Z:H=100:C=O+O:A=150:B=C*H
:GRAPHICS Z:POKE 559,Z:GOTO 1000
10 GOSUB 15000:GET #O,Y:IF (Y<32 OR Y>
90) AND Y<>126 AND Y<>155 THEN POKE 70
2,64:POKE 694,Z:GOTO 10
15 IF Y=155 THEN RETURN
20 IF (Y=126 AND L=O) OR (L=31 AND Y<>
126) THEN 10
25 IF Y=126 THEN L=L-O:I$=I$(O,L):? "◂
";:GOTO 10
30 ? CHR$(Y);:I$(L)=CHR$(Y):L=L+O:GOTO
 10
50 IF J>52 AND O(2)<255 OR J>58 THEN ?
 " (it's closed)":RETURN
55 ? " (it's open)":IF J>52 THEN L=O
60 RETURN
100 L=Z:POKE 82,0:D=Z:IF O(70)=Z AND O
(0)>21 THEN ? "↖            It's too dark
 to see!!! ":D=O
105 IF O(Z)>28 AND O(Z)<33 AND O(16)<2
55 THEN ? "↖ Every thing is blurry!!!
":D=O
110 RESTORE 9000+O(Z):READ L$,D$:Y=Z:I
F D THEN 145
112 ? "↖You're ";L$;".▸You see:":FOR J
=O TO 62
115 IF O(J)=O(Z) THEN RESTORE J+9500:R
EAD L$:? L$;".":Y=O:IF J<61 AND J>46 T
HEN GOSUB 50
117 NEXT J:IF  NOT Y THEN ? "Nothing s
pecial."
120 ? "Obvious exits:":L$="NorthSouthE
ast◂West◂Up◂◂◂Down◂":FOR J=O TO 6:IF A
SC(D$(J))>99 THEN ? "-Out";:GOTO 130
125 IF ASC(D$(J)) THEN J=J-O:? "-";L$(
J*5+O,J*5+5);:J=J+O
126 IF O(Z)=C THEN IF J=O THEN ? "-Out
```

```
";
130 NEXT J:? "-"
145 POKE 82,Z:? "←──────────────────────────────
──────────────────────── ";:POKE 82,O
147 IF L THEN ? "The card is glowing."
150 O(64)=O(64)+O:IF O(64)=60 THEN O(6
5)=O(65)+O:O(64)=Z:IF O(65)=12 THEN 99
98
154 IF O(73)=30 THEN 160
155 IF O(Z)=7 AND O(15)=255 THEN ? "Th
e barbell pulls you down!":FOR J=O TO
250:NEXT J:O(Z)=30:GOTO H
160 IF (O(Z)<21 AND O(Z)>17 AND O(6)<2
55) OR (O(Z)>28 AND O(Z)<33 AND O(18)<
255) THEN 9997
165 IF O(Z)<>39 AND O(66) THEN ? "The
alien devours you!!!":GOTO 8000
170 O(66)=Z:IF O(Z)=O(23) THEN ? "The
alien is opening it's mouth.":O(66)=O
175 IF O(67) AND O(67)<9 THEN O(67)=O(
67)+O:? "You're bleeding!":IF O(67)=8
THEN ? "You bled to death!":GOTO 8000
180 IF O(67)=Z AND O(Z)=32 THEN ? "The
 shark bit you.":O(67)=O
185 IF O(71) AND (O(9)>H AND O(9)<>110
 AND O(9)<>131) THEN ? "The fuel burst
s into flames!":GOTO 8000
190 O(71)=Z:IF O(9)=255 THEN O(71)=O:?
 "The fuel is VERY hot!"
200 O(73)=O(Z):S$="":S=Z:F=Z:L=O:I$=""
:? "Command:";:GOSUB 10:? :F$=I$:K=Z:L
=Z
205 IF LEN(F$)<3 THEN F$(LEN(F$)+O)="
":GOTO 205
210 L$="GO WALRUNENTCRASWICLIJUMSAYTEL
ASKYELSCRDROLEAPUTRELI  LOOEXADESSEERE
AGETTAKCRAPICHOLCATUSEPRETURCUTINV"
215 L$(103)="SAVPUSOPEQUISHONORSOUEASW
ESUP DOWOUTN  S  E  W  U  D  O  "
220 F=54-USR(ADR(M$),53,ADR(L$),ADR(F$
)):IF F>46 THEN F=F-7
225 K=K+O:IF F=47 OR K=O+C THEN ? "I d
on't understand that.":GOTO B
230 L=Z:IF F>39 THEN L=S+O*(S=Z):S=F-3
9:F=L:IF L<14 THEN GOTO B+H
240 IF F=L THEN K=C:GOTO 225
250 Y=Z:Q=Z:FOR J=O TO LEN(I$):TRAP 26
0:IF I$(J,J)=" " THEN S$=I$(J+O):IF  N
OT Y THEN Y=J+O
255 IF I$(J,J+C)="IN " OR I$(J,J+C)="F
RO" THEN Q=J
260 NEXT J:I=Z:IF Y=Z THEN S=63:GOTO B
+H
265 L$="WATCARBOOCONBANSUIPLAKEYFUEBAG
KNIGUNPISBATBARMASPAPSNOTREFERSHASHAAL
IMONROBBOXBOXDIACABBUTTANSPESCRADV"
270 L$(103)="SHUAQUFISROOAQUPOOCHACAGV
ENVENVENVENELEELEELEELEELEELEDOODOODOO
DOODOODOODOODOOUNIKLY"
275 S=63-USR(ADR(M$),62,ADR(L$)+I,ADR(
S$))+I/3
280 IF S=63 THEN S=F:F$=S$:TRAP 205:F$
=S$(O,O):GOTO 205
285 IF S<63 THEN IF O(S)<>O(Z) AND O(S
)<>255 THEN I=S*3:GOTO 275
290 IF S>62 THEN F$="-":GOTO 205
300 ON F GOTO 350,350,350,350,350,350,
350,350,550,550,550,550,550,450,450,45
0,450,775,500,500,500,500,500,400,400
301 ON F-25 GOTO 400,400,400,400,800,8
00,800,650,775,1015,800,600,1015,650
350 IF S>7 THEN 375
352 IF S=7 THEN 365
355 IF D$(S,S)="♥" OR ASC(D$(S))>99 TH
EN ? "You can't go that way.":GOTO B
357 IF O(Z)=24 AND S=O+C AND O(7)<255
THEN ? "Robot says:▸Improper identific
ation▸Passage denied.":GOTO A
360 O(Z)=ASC(D$(S)):GOTO H
365 IF O(Z)=C THEN O(Z)=O(69):GOTO H
367 FOR J=O TO 6:IF ASC(D$(J))>99 THEN
 O(Z)=ASC(D$(J))-H:GOTO H
370 NEXT J:? "You can't go that way.":
GOTO B
375 IF S<53 AND S>46 THEN O(69)=O(Z):O
(Z)=2:GOTO H
380 IF S=34 THEN O(Z)=39:GOTO H
381 IF S=35 THEN 900
382 IF S<47 AND S>42 THEN O(Z)=(S=43)*
11+(S=44)*13+(S=45)*10+(S=46)*9:GOTO H
383 IF S<59 AND S>52 AND O(2)<255 THEN
 ? "It's closed":GOTO B
384 IF S<59 AND S>52 THEN O(Z)=(S=53)*
6+(S=54)*4+(S=55)*15+(S=56)*14+(S=57)*
27+(S=58)*38:GOTO H
390 IF S=40 THEN O(Z)=7:GOTO H
392 IF S=36 THEN O(Z)=33:GOTO H
393 IF S=38 THEN ? "a long way down▸Ju
mp-wwhheee-THUD!!!▸You missed the swim
ming pool▸Broken neck!!!":GOTO 8000
399 ? "Nope.":GOTO B
400 IF Q THEN GOSUB 700:GOTO 725
405 IF S>20 THEN ? "You can't get that
.":GOTO B
410 IF O(S)<>O(Z) THEN ? "I don't see
it.":GOTO B
415 IF O(68)=O(72) THEN ? "You can't c
arry any more.":GOTO B
420 O(68)=O(68)+O:O(S)=255:GOTO H
450 IF Q THEN GOSUB 700:GOTO 750
455 IF O(S)<255 THEN ? "You don't have
 it.":GOTO B
460 O(68)=O(68)-O:O(S)=O(Z):GOTO H
500 IF S=63 THEN GOTO H
502 RESTORE S+9500-9*(S=41):READ L$,L$
:IF LEN(L$)>O THEN ? L$
505 IF L$="+" THEN ? "Sharkit brand"
507 IF S=17 THEN ? "reads:▸Shuttle cod
e:";C$
510 IF S=O THEN L$="00":L$(3-LEN(STR$(
O(64))))=STR$(O(64)):? "Time-";O(65);"
:";L$
517 IF L$="-" THEN ? "Nothing special.
"
522 IF S=42 THEN O(24)=35
525 IF S<>39 THEN 530
526 ? "You see:":FOR J=Z TO 37:IF O(J)
=32 THEN RESTORE 9500+J:READ L$:? L$;"
."
527 NEXT J
530 FOR J=O TO 28:IF O(J)=S+H THEN RES
TORE 9500+J:READ L$:? L$;" is in it."
535 NEXT J
545 GOTO A
550 TRAP B:? I$(Y);".":IF S>6 OR O(Z)<
>2 THEN GOTO A
555 O(69)=(S=O)+(S=2)*4+(S=3)*5+(S=4)*
3+(S=5)*15+(S=6)*34:? "Speaker says:▸Y
es sir.":GOTO A
600 IF S=26 AND O(8)<255 THEN ? "It's
locked":GOTO B
605 IF S=26 THEN O(S)=Z:O(27)=8:O(28)=
8:GOTO H
```

continued on next page

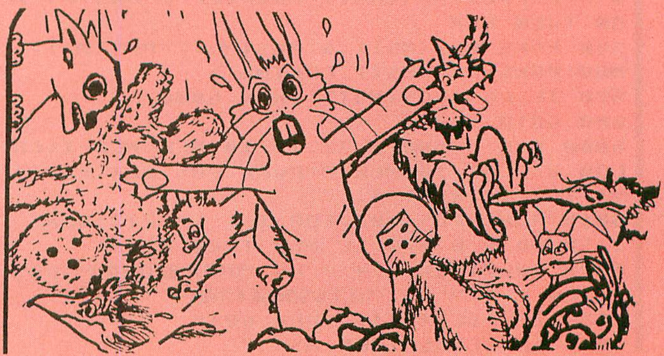
```
649 ? "Nope.":GOTO B
650 ? "USEing what?":GOTO B
700 S$="":I=Z:FOR J=0 TO Q-2:IF I$(J,J
)=" " THEN S$=I$(J+O)
705 NEXT J:IF S$="" THEN ? "Nope.":POP
:GOTO B
710 L=63-USR(ADR(M$),62,ADR(L$),ADR(S$
))
715 IF L=62 THEN ? "Nope.":POP :GOTO B
720 RETURN
725 IF O(L)<>S+H THEN ? "I don't under
stand.":GOTO B
730 S=L:GOTO 415
750 IF O(L)<255 THEN S=L:GOTO 455
755 O(L)=S+H:O(68)=O(68)-O:GOTO H
775 Y=Z:? "You have:":FOR J=0 TO 20:IF
 O(J)=255 THEN RESTORE 9500+J:READ L$:
? L$;".":Y=0
780 NEXT J:IF  NOT Y THEN ? "Nothing."
785 GOTO A
800 IF S=5 AND (O(5)<255 OR O(67)=Z) T
HEN ? "Nope.":GOTO B
805 IF S=5 THEN ? "O.K.":O(68)=O(68)-O
:O(5)=Z:O(67)=20:GOTO A
810 IF S=22 AND O(11)<255 THEN ? "noth
ing to cut it with.":GOTO A
815 IF (S=11 OR S=22) AND O(22)=32 AND
 O(17)=Z THEN ? "a piece of paper plop
s out.":O(17)=32:GOTO A
820 IF S=13 AND ((O(Z)>28 AND O(Z)<33)
 OR O(14)<113) THEN ? "Pistol does not
 work.":GOTO A
825 IF S=13 AND O(Z)=O(23) THEN ? "Zza
aappp!!!":FOR J=0 TO 250:NEXT J:O(23)=
0:O(66)=Z:GOTO H
830 IF S=13 THEN ? "The laser beam is
absorbed.":GOTO A
835 IF S=12 AND O(Z)<>O(21) THEN ? "Th
e spear shoots out▸a rope pulls it bac
k in":GOTO A
840 IF S=12 THEN ? "You hit the shark!
":O(21)=Z:O(22)=32:FOR J=0 TO 250:NEXT
 J:GOTO H
845 IF O(72)=5 AND S=15 THEN ? "You fe
el stronger!":O(72)=6:GOTO A
850 IF S=28 THEN ? "It clicks▸You hear
 a humming sound.":O(70)=0:GOTO A
855 IF S=30 AND O(9)<>131 THEN ? "read
s:▸NO FUEL":GOTO A
860 IF S=30 THEN 9999
865 ? "Nope.":GOTO A
900 L=0:I$="":? "Enter shuttle code:";
:GOSUB 10:IF I$<>C$ THEN ? "K FAULTY "
:GOTO A
905 O(Z)=21:GOTO H
1000 DIM O(73),F$(C+O),S$(C+O),C$(C+O)
,L$(186),D$(6),I$(30),M$(60):OPEN #0,4
,Z,"K":C$=STR$(INT(RND(Z)*900+H))
1005 M$="hh.Uh.Th.Nh.Mh.Lh.K ♥1KOMP/H@
┘PU♦%M┴i┘.M$ ◆N%TP/%UP\FUFT┴&X♦":RESTO
RE 1025:FOR J=Z TO 73:READ L
1010 O(J)=L:NEXT J
1015 GOSUB 5000:L=PEEK(560)+256*PEEK(5
61):POKE L+8,7:POKE L+9,6:POKE 710,Z:P
OKE 708,70:POKE 711,26
1020 ? "▸▸▸   ADVENT X-5          by Ed
 Casten":CLOSE #2:POKE 82,14:? "▸1. Pl
ay game▸2. Load game▸3. Save game"
1025 ? "4. New game▸5. Quit▸▸  Choice:
";:POKE 752,0:GET #0,Y:Y=Y-48:IF Y<0 O
R Y>5 THEN 1015
1030 GOSUB 5000:ON Y GOTO 100,2000,300
0,8020
1035 GRAPHICS Z:END
1100 DATA 1,1,103,129,129,104,39,14,14
,22,26,12,34,36,23,6,35,0,25,34,34,32,
0,18,0,24,8,0,0,5,21,21,2,3,18,20,28
1105 DATA 32,17,34,6,2,35,3,5,22,36,1,
3,4,5,15,34,4,6,14,15,28,36,38,27,17,1
,2,-1,6,0,0,0,0,0,5,1
2000 L=2005:GOTO 4000
2005 CLOSE #2:OPEN #2,4,Z,I$:FOR J=Z T
O 73:GET #2,K:O(J)=K:NEXT J:INPUT #2;C
$:GOTO 1015
3000 L=3005:GOTO 4000
3005 CLOSE #2:OPEN #2,8,Z,I$:FOR J=Z T
O 73:PUT #2,O(J):NEXT J:PRINT #2;C$:GO
TO 1015
4000 I$="D:ADVENTX5.DTA":TRAP 4005:GOT
O L
4005 IF PEEK(195)=138 THEN TRAP 4010:I
$="C:":GOTO L
4010 ? " ERROR  KKKKK":GOTO 1015
5000 GRAPHICS Z:POKE 82,O+O:FOR J=675
TO 689:POKE J,Z:NEXT J:RETURN
8000 ? "You're dead."
8010 ? "▸please press RETURN";:GET #0
,Y:RUN
9001 DATA on the ships bridge,♥♥♥♥♥'
9002 DATA in a voice activated elevato
r,♥♥♥♥♥♥
9003 DATA in a computer room,♥♥♥♥♥♥
9004 DATA in a cafeteria,♥♥♥♥♥♥
9005 DATA in a medical lab,♥♥♥♥♥♥
9006 DATA in a recreation room,♥◢♥♥♥♥
9007 DATA swimming in the pool,j♥♥♥♥♥
9008 DATA in the power control room,/♥
♥♥♥♥
9009 DATA in an air duct,◤♥♥♥‾♥
9010 DATA in an air duct,▀z♥♥♥♥
9011 DATA in an air duct,g◣▀ ♥♥♥
9012 DATA in an air duct,♥♥‾▀♥♥
9013 DATA in an air duct,i♥♥▀ ♥▄
9014 DATA in the captain's quarters,♥♥
♥♥♥♥
9015 DATA in a crew's sleeping barrack
s,♥♣♥♥♥♥
9016 DATA in a tubular corridor,▄ ┌♥♥♥♥
9017 DATA on an observation deck,♣♥♥♥♥
♥
9018 DATA on the surface of Klybex-7,┼
♥┼●♥♥
9019 DATA on the surface of Klybex-7,┼
─┼─♥♥
9020 DATA in a giant crater,♥♥─♥♥♥
9021 DATA in the escape shuttle,x♥♥♥♥♥
9022 DATA in a fuel storage area,♥♥♥♥♥
┴
9023 DATA in an engine room,♥♥♥♥♥└
9024 DATA in the west cargo hold,♥♥▌♥▌
♥
9025 DATA at a loading dock,ㄷ♥┴┴♥♥
9026 DATA in the east cargo hold,♥♥♥▌┬
♥
9027 DATA in a tubular corridor,♥▌♥♥♥♥
9028 DATA in a compression chamber,♥♥♥
♥♥♥
9029 DATA in an aqueduct,←!♥♥♥♥
9030 DATA at the bottom of the pool,→↓
♥♥\♥
9031 DATA in an aqueduct, ←♥♥♥♥
9032 DATA in an aquarium,♥→♥♥♥♥
9033 DATA at an aquaduct outlet,↓◘♥♥♥♥
9034 DATA in a giant terrarium,♥♥&%♥♥
```

```
9035 DATA in a primate room,%♥♥♥♥♥♥
9036 DATA in a water control room,♥♥♥♥
♥♥
9037 DATA in a tubular corridor,♥#"♥♥♥
9038 DATA in a tubular corridor,♥♥♥"♥♥
9039 DATA in an air lock,V♥♥♥├♥
9501 DATA a wrist watch,-
9502 DATA a plastic card,It's red.▸rea
ds:▸ DOOR 
9503 DATA a book,reads:▸HOW TO KILL AN
 ALIEN▸Use a laser pistol (with a batt
ery▸in it) on the alien.
9504 DATA a container,a red cross is o
n it
9505 DATA a bandage,+
9506 DATA a space suit,It has oxygen
9507 DATA an ID plate,reads:▸RoboID: C
AP 594C53▸Carry at all times.
9508 DATA a key,reads:▸P.B.K.
9509 DATA puddy fuel,It's green & glow
ing
9510 DATA an asbestocine bag,-
9511 DATA a knife,+
9512 DATA a spear gun,+
9513 DATA a laser pistol,-
9514 DATA a battery,Dura-Sell brand
9515 DATA a barbell,300 lbs & water-pr
oof
9516 DATA a swimming mask,+
9517 DATA a piece of paper,-
9518 DATA a snorkelizer,+
9519 DATA a tree,it's a baby oak
9520 DATA a fern,-
9521 DATA a shark,it's a great white
9522 DATA a dead shark,it's very dead
9523 DATA an alien,one mean dude
9524 DATA a monkey,it's a chimp▸it's h
ead is shaved
9525 DATA a robot,Gaurd-O-Matic kind
9526 DATA a large box,reads:▸Power▸it'
s metal▸it's bolted to the floor▸it's
locked
9527 DATA a large open box,reads:▸Lowe
r level▸a dial is in it
9528 DATA a dial,it turns
9529 DATA an open cabinet,a red cross
is on it
9530 DATA a button,it's flashing
9531 DATA a fuel tank,reads:▸Puddy Fue
l Tank
9532 DATA a speaker/microphone,says:▸S
ay deck name then exit
9533 DATA a computer screen,reads:▸ast
eroid collision-12:00▸shuttle code los
t in pool▸shark is sick to stomach
9534 DATA the Advent X-5,-
9535 DATA the escape shuttle,-
9536 DATA an aqueduct outlet,-
9537 DATA a fish.▸some coral.▸sea weed
,-
9538 DATA a rec. room 20 feet below,-
9539 DATA an aquarium,-
9540 DATA a swimming pool,it's deep
9541 DATA a chart:▸        Uplez        ▸
       ◢ Norec▸ Wesox─┼─Eafop ▸Sourk ◢
       ▸        Dowes        ,-
9542 DATA a cage,a monkey is in it
9543 DATA a vent,It's open
9544 DATA a vent,It's open
9545 DATA a vent,It's open
9546 DATA a vent,It's open
9547 DATA an elevator,-
9548 DATA an elevator,-
9549 DATA an elevator,-
9550 DATA an elevator,-
9551 DATA an elevator,-
9552 DATA an elevator,-
9553 DATA a red door,-
9554 DATA a red door,-
9555 DATA a red door,-
9556 DATA a red door,-
9557 DATA a red door,-
9558 DATA a red door,-
9559 DATA a blue door,-
9560 DATA a blue door,-
9561 DATA the universe,lots of stars
9562 DATA the surface of Klybex-7,a sh
uttle is to the west
9997 ? "You can't breath!!!":GOTO 8000
9998 FOR J=0 TO 7:? "BBOOOMMM!!!":NEXT
 J:? "An asteroid hit Klybex-7":GOTO 8
000
9999 FOR J=0 TO 10:? "Congratulations!
!!":NEXT J:? "You blasted off and▸safe
ly made it to a▸local star base."
10000 GOTO 8010
15000 POKE 16,64:POKE 53774,64:RETURN
```

TYPO TABLE

Variable checksum = 227567

Line num range	Code	Length
1 - 55	HH	507
60 - 120	KD	507
125 - 160	UA	582
165 - 190	AF	553
200 - 230	KR	532
240 - 280	SO	502
285 - 355	BV	540
357 - 383	LO	552
384 - 415	LF	521
420 - 525	IR	489
526 - 650	TE	516
700 - 785	ZO	419
800 - 825	XI	534
830 - 900	SN	559
905 - 1020	HE	514
1025 - 3000	MS	508
3005 - 9005	NZ	485
9006 - 9017	UI	388
9018 - 9029	WH	405
9030 - 9502	GB	385
9503 - 9514	ZE	421
9515 - 9526	AW	397
9527 - 9538	ZZ	493
9539 - 9550	SU	340
9551 - 9562	SR	270
9997 - 15000	UG	273



OMNIVENTURE

LISTING 1

```
1 REM     ANTIC MAGAZINE
2 REM       OMNIVENTURE
3 REM    BY JERRY LEMAITRE
4 REM
80 GOSUB 9000
90 GOTO 9270
100 S=PEEK(632):MOV=0:P=PEEK(POS+MOV(S
)):IF  NOT P THEN MOV=1:POKE 77,0:GOTO
 300
110 IF P=141 THEN MOV=0:GOSUB 10040
120 IF P=2 OR P=3 THEN 6000
130 IF P=198 THEN POSITION 10,22:? #6;
A$:CARRY=1:MOV=1:SOUND 0,12,12,8
140 IF P=199 THEN POSITION 10,22:? #6;
B$:CARRY=2:MOV=1:SOUND 0,12,12,8
150 IF P=136 THEN SC=SC+100:POSITION 4
,22:? #6;SC:MOV=1:SOUND 0,10,10,10
300 IF MOV THEN POKE POS,0:POS=POS+MOV
(S):POKE POS,MAN
310 F=PEEK(644):IF F OR CARRY<>1 THEN
400
320 FOR I=5 TO 14:SWG=POS+MOV(I)
330 SOUND 0,I+50,8,8:IF PEEK(SWG)=2 OR
 PEEK(SWG)=3 THEN POKE SWG,204:SC=SC+2
5:POSITION 4,22:? #6;SC
340 FOR T=1 TO SK*2:IF POS(T)=SWG THEN
 FLAG(T)=0
350 NEXT T:NEXT I:POSITION 10,22:? #6;
" NOTHING ":CARRY=0:FOR I=5 TO 14:P=PO
S+MOV(I):IF PEEK(P)=204 THEN POKE P,0
360 NEXT I:SOUND 0,0,0,0
400 SOUND 0,0,0,0:IF F OR CARRY<>2 THE
N 500
410 FOR I=5 TO 14:SWG=POS+MOV(I)
420 SOUND 0,I+50,8,8:IF PEEK(SWG)=68 O
R PEEK(SWG)=69 THEN POKE SWG,204
430 NEXT I:POSITION 10,22:? #6;" NOTHI
NG ":CARRY=0:FOR I=5 TO 14:IF PEEK(POS
+MOV(I))=204 THEN POKE POS+MOV(I),0
440 NEXT I:SOUND 0,0,0,0
500 CH=CH+1:POKE 756,CH(CH):FOR I=SK*7
 TO 70:NEXT I:IF CH=1 THEN CH=-1
510 MST=MST+1:IF MST>SK*2 THEN MST=1
520 IF  NOT FLAG(MST) THEN 600
530 M=POS(MST):M1=INT(M/20):P1=INT(POS
/20):MOV=(POS-P1*20>M-M1*20)-(POS-P1*2
0<M-M1*20)+20*(P1>M1)-20*(P1<M1)
540 P=PEEK(POS(MST)+MOV):IF P AND P<>M
AN THEN 600
550 POKE POS(MST),0:POS(MST)=POS(MST)+
MOV:POKE POS(MST),COL(MST)
570 IF POS=POS(MST) THEN 6000
600 GOTO 100
6000 P=0:SOUND 0,72,12,10:MEN=MEN-1:CO
LOR 0:PLOT 16+MEN,0:POKE POS,204:FOR I
=1 TO 111:NEXT I
6010 POKE POS,203:FOR I=1 TO 222:NEXT
I:SOUND 0,0,0,0:IF MEN THEN 6200
6020 POSITION 5,4:? #6;"GAME OVER":POS
ITION 4,6:? #6;"PRESS FIRE!"
6030 IF PEEK(644) THEN 6030
6040 IF SC>HS THEN HS=SC
6050 GOTO 90
6200 POSITION 5,5:? #6;"YOU DIED!":FOR
 I=0 TO 10:FOR I1=0 TO 70:SOUND 0,I1,1
0,10-I:NEXT I1:NEXT I:GOTO 10040
9000 DIM MOV$(39):RESTORE 9001:FOR I=1
 TO 39:READ A:MOV$(I,I)=CHR$(A):NEXT I
9001 DATA 104,104,133,215,104,133,214,
104,133,217,104,133,216,104,133,218,10
4,170,160,0,177,214,145,216
9002 DATA 200,208,4,230,215,230,217,20
2,208,242,198,218,16,238,96
9008 DIM A$(9),B$(9),C$(7),CH(1),MOV(1
5),FLAG(20),POS(20),COL(20)
9010 A$="  CLUB   ":B$=" MACHETTE":C$=
" DINO"
9020 GRAPHICS 18:POSITION 7,4:? #6;C$;
"-":POSITION 7,6:? #6;"VENTURE"
9030 CH(0)=PEEK(106)-8:CH(1)=CH(0)-8:D
=USR(ADR(MOV$),57344,CH(0)*256,1023)
9040 FOR A=1 TO 13:FOR I=0 TO 7:READ B
:POKE CH(0)*256+A*8+I,B:POKE 708,B:NEX
T I:NEXT A
9050 DATA 7,15,30,56,48,0,192,192
9060 DATA 6,15,12,15,157,156,158,119
9070 DATA 0,0,195,102,60,24,0,0
9080 DATA 102,255,189,153,24,24,24,60
9090 DATA 0,4,10,20,10,30,63,0
9100 DATA 6,15,15,31,30,56,96,192
9110 DATA 16,24,24,24,24,60,24,24
9120 DATA 40,2,152,61,28,129,40,0
9130 DATA 24,60,24,60,90,24,36,36
9140 DATA 255,255,255,255,255,255,255,
255
9150 DATA 0,0,24,60,60,60,60,60
9160 DATA 137,74,36,192,3,36,82,145
9170 DATA 0,32,80,136,5,2,0,0
9200 D=USR(ADR(MOV$),CH(0)*256,CH(1)*2
56,1023)
9210 READ A:IF A=-1 THEN RETURN
9220 FOR I=0 TO 7:READ B:POKE CH(1)*25
6+A*8+I,B:POKE 708,B:NEXT I:GOTO 9210
9230 DATA 2,24,60,12,15,93,156,158,119
9240 DATA 3,0,0,0,126,219,129,0,0
9250 DATA 8,20,64,25,188,29,64,18,0
9260 DATA 9,24,60,24,126,24,24,36,66
9266 DATA 13,0,2,5,136,80,32,0,0,-1
9270 MOV(5)=21:MOV(6)=-19:MOV(7)=1:MOV
(9)=19:MOV(10)=-21:MOV(11)=-1:MOV(13)=
20:MOV(14)=-20
9300 GRAPHICS 1:POKE 710,0:POKE 756,CH
(0):POSITION 6,0:? #6;"welcome!":POSIT
ION 6,1:? #6;"********"
9310 ? #6:? #6;" )-this is you!"
9320 ? #6:? #6;" &-club-for animals"
9330 ? #6:? #6;" '-knife-for plants"
9340 ? #6:? #6;" (-diamond-100 pts."
9350 ? #6:? #6;" ";CHR$(34);"-tyrannos
aurus-25"
9360 ? #6:? #6;" #-pterodactyl-25"
9370 ? #6:? #6;" $-cypress tree"
9380 ? #6:? #6;" %-ginkgo plant"
9390 TRAP 9390:? CHR$(125);"Select Ski
```

```
11 Level.1-10";:INPUT SK:IF SK<1 OR SK
>10 OR INT(SK)<>SK THEN 0
10000 TRAP 44444:GRAPHICS 17:POKE 756,
CH(0):COLOR 173:PLOT 1,1:DRAWTO 18,1:C
OLOR 10:PLOT 0,20:DRAWTO 19,20
10010 PLOT 0,0:DRAWTO 0,23:DRAWTO 19,2
3:DRAWTO 19,0:POSITION 1,21:? #6;"hs:"
;HS:POSITION 1,22:? #6;"sc:0"
10020 POSITION 1,0:? #6;C$;"VENTURE!":
POSITION 10,21:? #6;"carrying:":POSITI
ON 11,22:? #6;"NOTHING"
10030 POKE 708,103:POKE 709,215:POKE 7
10,31:POKE 711,40:POKE 712,192
10035 COLOR 137:PLOT 17,0:PLOT 18,0:ME
N=3:SC=0
10040 COLOR 32:FOR I=2 TO 19:PLOT 1,I:
DRAWTO 18,I:NEXT I:FOR I=0 TO 20:FLAG(
I)=1:POS(I)=77:NEXT I
10050 FOR I=0 TO 150:COLOR INT(2*RND(0
)+4):PLOT INT(18*RND(0)+1),INT(18*RND(
0)+2):NEXT I:COLOR 32:PLOT 5,19
10060 DRAWTO 15,19:FOR I=0 TO 10-SK:CO
LOR INT(2*RND(0)+134):PLOT INT(18*RND(
0)+1),INT(18*RND(0)+2):NEXT I
10070 COLOR 168:FOR I=0 TO 6-SK/2:PLOT
 INT(18*RND(0)+1),INT(18*RND(0)+2):NEX
T I
10080 SCR=PEEK(88)+256*PEEK(89):TOP=SC
R+40:POS=SCR+389:MAN=201:POKE POS,MAN
10090 FOR I=1 TO SK*2:COL(I)=INT(2*RND
(0)+2)
10100 POS(I)=INT(360*RND(0)+40+SCR):P=
PEEK(POS(I)):IF P=74 OR P=2 OR P=3 OR
P=MAN THEN 10100
10110 POKE POS(I),COL(I):NEXT I:GOTO 1
00
```

TYPO TABLE

Variable checksum = 744834

Line num range			Code	Length
1	-	150	VF	595
300	-	400	PW	505
410	-	530	MC	546
540	-	6200	VX	595
9000	-	9030	TH	569
9040	-	9150	ON	429
9160	-	9270	TV	560
9300	-	9380	WN	507
9390	-	10020	RL	503
10030	-	10060	FW	571
10070	-	10110	WT	381

LISTING 2

```
2 REM        DRAGOVENTURE
9010 A$="  SWORD  ":B$="  HAMMER ":C$=
" DRAGO"
9060 DATA 97,243,55,246,52,48,121,246
9070 DATA 0,28,118,222,247,127,30,0
9080 DATA 239,239,239,0,127,127,127,0
9090 DATA 123,123,123,0,222,222,222,0
9100 DATA 0,0,32,255,32,0,0,0
9110 DATA 0,0,96,126,96,96,0,0
9120 DATA 0,42,0,157,56,254,127,255
9230 DATA 2,24,60,49,119,182,48,121,24
6
9240 DATA 3,24,60,108,126,110,58,30,28
9250 DATA 8,0,20,65,28,56,254,127,255
9310 ? #6:? #6;" )-this is you!"
9320 ? #6:? #6;" &-sword-for animals"
9330 ? #6;" '-hammer-for walls"
9340 ? #6:? #6;" (-gold-100 pts."
9350 ? #6:? #6;" ";CHR$(34);"-green dr
agon-25"
9360 ? #6:? #6;" #-ochre jelly-25"
9370 ? #6:? #6;" $-brick wall"
10030 POKE 708,183:POKE 709,9:POKE 710
,27:POKE 711,40:POKE 712,32
```

LISTING 3

```
2 REM        ROBOVENTURE
9010 A$="  PHAZOR ":B$=" DEACTOR ":C$=
" ROBO"
9060 DATA 60,110,60,126,90,24,20,40
9070 DATA 0,8,28,62,28,8,0,0
9080 DATA 255,0,255,0,255,0,255,0
9090 DATA 255,129,189,165,165,189,129,
255
9100 DATA 0,124,127,28,16,16,0,0
9110 DATA 0,0,100,42,100,0,0,0
9120 DATA 0,40,2,88,26,64,20,0
9230 DATA 2,60,118,60,126,153,24,40,20
9240 DATA 3,8,42,28,127,28,42,8,0
9250 DATA 8,0,20,64,26,88,2,40,0
9310 ? #6:? #6;" )-this is you!"
9320 ? #6:? #6;" &-Phazor-for droids"
9330 ? #6;" '-deactor-for walls"
9340 ? #6;" (-biochip-100 pts."
9350 ? #6:? #6;" ";CHR$(34);"-robodroi
d-25"
9360 ? #6:? #6;" #-blippot-25"
9370 ? #6:? #6;" $-terminoid"
9380 ? #6:? #6;" %-electrowall"
10030 POKE 708,29:POKE 709,136:POKE 71
0,198:POKE 711,40:POKE 712,208
```

WINDOWS

LISTING 1

```
1 REM WINDOWS BASIC DEMO
2 REM BY JERRY WHITE & DAVE CULBERTSON
3 REM ANTIC MAGAZINE
100 GRAPHICS 0:POKE 752,1:JIF=120
110 DIM A$(961),D$(97),B$(241),W$(116)
,C$(61)
120 ? :? "CREATING W$":FOR ME=1 TO 116
:READ IT:W$(ME,ME)=CHR$(IT):NEXT ME
130 ? :? "CREATING C$":FOR ME=1 TO 61:
READ IT:C$(ME,ME)=CHR$(IT):NEXT ME
140 A$=".":A$(960)=".":A$(2)=A$:A$(961
)="♥"
150 A$(131,154)=" Windows by Jerry Whi
te "
160 A$(171,191)=" and Dave Culbertson
"
170 D$="*************** Windows  ** can
show ** WHAT you **  "
180 D$(52,97)=" Want   ** WHERE  **
you want ****************♥"
190 B$="■":B$(240)="■":B$(2)=B$:B$(241
)="♥"
200 B$(35,55)="   All sizes / kinds
"
210 B$(92,119)=" Work in ANY graphics
mode "
220 B$(157,178)="You are FREE from the
■"
230 B$(188,201)=" ATARI Editor!"
240 GRAPHICS 0:POKE 752,1:?
250 X=USR(ADR(C$),ADR(A$))
260 X=USR(ADR(C$),ADR(D$))
270 X=USR(ADR(C$),ADR(B$))
280 SOUND 0,0,2,2:GOSUB 370:GOSUB 340
290 SOUND 0,2,2,2:GOSUB 340:GOSUB 370
300 IF LFLG=0 THEN LIST 470,670:LFLG=1
310 COUNT=COUNT+1:IF COUNT>=4 THEN GOS
UB 380:GOSUB 390:GOSUB 380:JIF=10
320 IF COUNT>=7 THEN GRAPHICS 0:? :? "
BASIC":? "IS";:END
330 GOTO 280
340 IF JIF=10 THEN LOF=41
350 IF JIF=120 THEN LOF=39
360 X=USR(ADR(W$),ADR(D$),412,8,12,LOF
):GOSUB 390:RETURN
370 X=USR(ADR(W$),ADR(A$),0,24,40,40):
GOSUB 390:RETURN
380 X=USR(ADR(W$),ADR(B$),285,8,30,40)
:GOSUB 390:RETURN
390 POKE 540,JIF:SOUND 0,0,0,0
400 IF PEEK(540) THEN 400
410 RETURN
420 DATA 104,104,133,206,104,133,205
430 DATA 104,141,1,6,104,141,0
440 DATA 6,104,133,208,104,133,207
450 DATA 104,104,133,209,104,141,3
460 DATA 6,104,141,2,6,165,88
470 DATA 133,203,165,89,133,204,24
480 DATA 165,203,109,0,6,133,203
490 DATA 165,204,109,1,6,133,204
500 DATA 160,0,177,203,170,177,205
510 DATA 145,203,138,145,205,200,196
520 DATA 209,208,241,169,0,198,207
530 DATA 197,207,208,6,197,208,240
540 DATA 30,198,208,24,152,101,205
550 DATA 133,205,144,3,230,206,24
560 DATA 165,203,109,2,6,133,203
570 DATA 165,204,109,3,6,133,204
580 DATA 24,144,197,96
590 DATA 104,104,133,204,104,133,203
600 DATA 160,0,177,203,170,201,0
610 DATA 240,44,41,96,201,0,208
620 DATA 6,138,9,64,24,144,22
630 DATA 201,96,240,20,138,41,64
640 DATA 201,0,208,6,138,73,32
650 DATA 24,144,5,138,9,32,73
660 DATA 64,145,203,200,208,210,230
670 DATA 204,24,144,203,96
```

TYPO TABLE

Variable checksum = 205504

Line num range	Code	Length
1 - 170	TB	533
180 - 290	VK	535
300 - 410	QW	500
420 - 530	EL	363
540 - 650	MD	336
660 - 670	FI	55

LISTING 2

```
0100 ; WINDOWS
0110 ; BY DAVE CULBERTSON
0120 ; ANTIC MAGAZINE
0130 ; EQUATES
0140 SCRN =   $CB      ;Beg Adr of windo
w
0150 ASTR =   $CD      ;Adr of data stri
ng
0160 OFFS =   $0600    ;Offset into scre
en
0170 ; (upper left corner of box)
0180 ; ELEMENT SEGMENT SPEC'S
0190 ELEM =   $CF      ;# of elements
0200 ELEW =   $D1      ;Element width
0210 ELEO =   $0602    ;Element offset
0220 ; (Upper left corner of element)
0230 ;
0240      *=  $0600    ; RELOCATABLE
0250      PLA          ;Get # OF Prams o
ff stack
0260 ; GET ADDRESS OF DATA STRING
0270      PLA
0280      STA ASTR+1
0290      PLA
0300      STA ASTR
0310 ; GET OFFSET FROM BEG OF SCREEN
0320      PLA
0330      STA OFFS+1
```

```
0340       PLA
0350       STA OFFS
0360 ;  GET # OF ELEMENTS FOR WINDOW
0370       PLA
0380       STA ELEM+1
0390       PLA
0400       STA ELEM
0410 ;  GET ELEMENT WIDTH
0420       PLA
0430       PLA
0440       STA ELEW
0450 ;  GET ELEMENT OFFSET
0460       PLA
0470       STA ELEO+1
0480       PLA
0490       STA ELEO
0500 ;  INITIAL SET-UP
0510       LDA $58       ;Adr OF S.M. (Lo)
0520       STA SCRN
0530       LDA $59       ;Adr of S.M. (Hi)
0540       STA SCRN+1
0550 ;  ADD OFFSET TO SCRN VALUE
0560 ;Initially this routine sets-up
0570 ;the upper left corner of the
0580 ;window.
0590 B0   CLC
0600       LDA SCRN
0610       ADC OFFS
0620       STA SCRN
0630       LDA SCRN+1
0640       ADC OFFS+1
0650       STA SCRN+1
0660 ;  SWAP SCREEN & STRING
0670 C1   LDY #0        ;Width Counter
0680 C2   LDA (SCRN),Y
0690       TAX
0700       LDA (ASTR),Y
0710       STA (SCRN),Y
0720       TXA
0730       STA (ASTR),Y
0740       INY
0750       CPY ELEW
0760       BNE C2
0770 ;  CHECK FOR ANOTHER ELEMENT
0780       LDA #0        ;Check Lo Byte.
0790       DEC ELEM      ;Sub 1.
0800       CMP ELEM      ;Is it zero?
0810       BNE C3        ;No then C3.
0820       CMP ELEM+1    ;Is Hi byte zero?
0830       BEQ EX        ;Yes - exit.
0840       DEC ELEM+1    ;No then sub 1.
0850 ; INDEX STRING FOR NEXT ELEMENT
0860 C3   CLC
0870       TYA           ;Add index to
0880       ADC ASTR      ;string pointer.
0890       STA ASTR
0900       BCC D0
0910       INC ASTR+1
0920 ; UPDATE SCREEN POINTER
0930       CLC
0940 D0   LDA SCRN      ;  Then Add
0950       ADC ELEO
0960       STA SCRN      ;  ELEO to SCRN
0970       LDA SCRN+1
0980       ADC ELEO+1
0990       STA SCRN+1
1000       CLC           ;Go do next Eleme
nt.
1010       BCC C1
1020 ; ALL DONE RETURN TO BASIC
1030 EX   RTS
```

LISTING 3

```
0100 ;ATASCII TO SCREEN CONVERTER
0110 ;BY DAVE CULBERTSON
0120 ;ANTIC MAGAZINE
0130 ;
0140 ; Equates
0150 LOC =     $CB       ;Address of data
string.
0160 ;
0170      *=  $0600     ;RELOCATABLE
0180 ; Get params from stack
0190      PLA            ;GET # OF PARM'S.
0200      PLA            ;GET HI LOC.
0210      STA LOC+1      ;STORE IT.
0220      PLA            ;GET LO LOC.
0230      STA LOC        ;STORE IT.
0240 ; BIT TWIDDLING BEGINS HERE!
0250 S    LDY #0         ;ZERO POINTER.
0260 B    LDA (LOC),Y    ;GET # FROM STRIN
G.
0270      TAX            ;COPY IT INTO 'X'
.
0280      CMP #0         ;IS IT END OF STR
ING?
0290      BEQ F          ;YES, GOTO 'F'.
0300      AND #96        ;MASK BITS 32 & 6
4.
0310      CMP #0         ;IS IT 3RD GROUP?
0320      BNE C          ;NO, GOTO 'C'.
0330 ;      Convert 3rd group
0340      TXA            ;RESTORE #.
0350      ORA #64        ;SET BIT 64 HI.
0360      CLC            ;DONE, GOTO 'D'.
0370      BCC D
0380 ;  CHECK groups 1,2, and 4.
0390 C    CMP #96        ;IS IT 4TH GROUP?
0400      BEQ E          ;YES, GOTO 'E'.
0410      TXA            ;NO, RESTORE #.
0420      AND #64        ;IS BIT 64 HI?
0430      CMP #0
0440      BNE H          ;YES, GOTO 'H'.
0450 ;      Convert 1st group
0460      TXA            ;NO, RESTORE #.
0470      EOR #32        ;SET BIT 32 LO.
0480      CLC            ;DONE, GOTO 'D'.
0490      BCC D
0500 ;      Convert 2nd group
0510 H    TXA            ;RESTORE #.
0520      ORA #32        ;SET BIT 32 HI.
0530      EOR #64        ;SET BIT 64 LO.
0540 ; ALL CONVERTED STORE & DO NEXT
0550 D    STA (LOC),Y    ;PUT CONVERTED BA
CK.
0560 E    INY            ;BUMP POINTER +1.
0570      BNE B          ;IF Y<>0 GOTO 'B'
0580      INC LOC+1      ;BUMP LOC 1 PAGE.
0590      CLC
0600      BCC S          ;GOTO 'S'.
0610 ; ALL DONE
0620 F    RTS
```

a cursor construction set

CREATE YOUR OWN CURSOR

LISTING 1

```
100 REM PMCURSOR
102 REM BY JERRY WHITE
104 REM ANTIC MAGAZINE
110 GOSUB 320
120 REM MOVE MACHINE LANGUAGE ROUTINE
130 REM INTO HIGH RAM.
140 FOR ME=0 TO 180:READ IT:POKE ROUTI
NE+ME,IT
150 POSITION 26,5:? ROUTINE+ME;:NEXT M
E:POKE 752,0
160 REM TELL THE HUMAN WHAT TO DO.
170 POSITION 1,5:? "POKE 752,1 TURNS O
UR CURSOR ON"
180 ? :? "POKE 752,0 TURNS ATARI CURSO
R ON"
190 ? :? "ENTER CURSOR FLASH RATE (1-6
4)";:TRAP 190:INPUT RATE
200 IF RATE<1 OR RATE>64 THEN 190
210 POKE ROUTINE+55,RATE
220 ? :? "ENTER CURSOR COLOR (0-255)";
:TRAP 220:INPUT CCOLOR:TRAP 40000
230 IF CCOLOR<0 OR CCOLOR>255 THEN 220
240 POKE ROUTINE+74,CCOLOR
250 ? :? "WARNING: THIS ROUTINE USES P
AGE SIX"
260 ? :? "AS P/M RAM (PLAYER 2)."
270 REM TURN ON OUR VBLANK ROUTINE.
280 CURSOR=USR(ROUTINE)
290 REM RETURN CONTROL TO THE HUMAN.
300 POKE 752,1:? :? "BASIC":? "IS";:EN
D
310 REM SETUP SUBROUTINE.
320 GRAPHICS 0:POKE 752,1:POKE 82,1:PO
KE 83,39
330 REM ROUTINE=SAFELY UNDER THE
340 REM DISPLAY LIST OF ANY GR MODE.
350 ROUTINE=(PEEK(106)-33)*256
360 ? :? "PLAYER CURSOR BY JERRY WHITE
"
370 ? :? "MACHINE LANGUAGE ROUTINE ADD
RESS=";ROUTINE
380 ? :? "STORING DATA AT LOCATION ";:
RETURN
390 REM DATA FOR MACHINE LANGUAGE
400 REM PLAYER CURSOR ROUTINE.
410 DATA 104,165,212,24,105,36,133,212
420 DATA 165,213,105,0,133,213,162,7
430 DATA 160,144,177,212,157,0,6,136
440 DATA 202,16,247,164,212,166,213,16
9
450 DATA 7,76,92,228,173,240,2,240
460 DATA 124,173,43,2,240,4,169,0
470 DATA 240,6,173,8,6,24,105,8
480 DATA 141,8,6,48,104,160,255,169
490 DATA 0,153,0,6,136,192,8,208
500 DATA 248,169,10,141,194,2,141,20
510 DATA 208,169,1,141,111,2,141,27
520 DATA 208,169,0,141,10,208,169,0
530 DATA 141,7,212,169,2,141,29,208
540 DATA 169,58,141,47,2,141,0,212
550 DATA 166,85,164,84,165,87,13,147
560 DATA 2,240,12,173,191,2,201,4
570 DATA 208,35,152,24,105,20,168,138
580 DATA 10,10,105,48,141,2,208,152
590 DATA 10,10,10,105,39,168,162,7
600 DATA 189,0,6,153,0,6,136,202
610 DATA 16,246,76,98,228,169,0,141
620 DATA 2,208,76,98,228
630 DATA 0,0,0,0,0,0,0,240
640 REM DATA IN LINE 630 IS THE
650 REM PLAYER CURSOR SHAPE.
```

TYPO TABLE

Variable checksum = 178926

Line num range	Code	Length
100 - 190	ID	394
200 - 310	BF	388
320 - 430	RH	452
440 - 550	CB	379
560 - 650	CW	287

LISTING 2

```
1000 ; LISTING 2 PMCURSOR.SRC
1010 ; PLAYER CURSOR BY JERRY WHITE
1020 ; AND CARLOS REYES
1030 ;
1040 ;System Equates
1050 ;
1060 ROWCRS=$54
1070 COLCRS=$55
1080 DINDEX=$57
1090 FR0=$D4
1100 SRTIMR=$22B
1110 SDMCTL=$22F
1120 GPRIOR=$26F
1130 TXTROW=$290
1140 TXTCOL=$291
1150 TINDEX=$293
1160 BOTSCR=$2BF
1170 PCOLR2=$2C2
1180 CRSINH=$2F0
1190 HPOSP2=$D002
1200 SIZEP2=$D00A
1210 COLPM2=$D014
1220 GRACTL=$D01D
1230 PRIOR=$D01B
1240 DMACTL=$D400
1250 PMBASE=$D407
1260 SETVBV=$E45C
1270 XITVBV=$E462
1280 ;
```

```
1290 ;Program Equates
1300 ;
1310 PSTART=0
1320 PLAYER2=PSTART+$600
1330 PSHAPE=PSTART+$600 ;Shape data
1340 PCOLOR=10
1350 PRATE=8
1360 PFLASH=PSHAPE+8
1370 ;
1380 ;Call from BASIC where ROUTINE
1390 ;is the address of this routine
1400 ;CURSOR=USR(ROUTINE)
1410 ;
1420  *=$4000          ;Relocatable
1430 ;
1440 INIT
1450  PLA              ;# arguments=0
1460  LDA FR0          ;FR0=INIT
1470  CLC
1480  ADC #MAIN-INIT&$FF
1490  STA FR0
1500  LDA FR0+1
1510  ADC #MAIN-INIT/$100
1520  STA FR0+1        ;FR0=MAIN
1530  LDX #8-1         ;Move cursor data
1540  LDY #SHAPE-MAIN+7
1550 LOOP
1560  LDA (FR0),Y
1570  STA PSHAPE,X
1580  DEY
1590  DEX
1600  BPL LOOP
1610  LDY FR0          ;Enable VBLANK
1620  LDX FR0+1
1630  LDA #7           ;Deferred
1640  JMP SETVBV       ;Return
1650 ;
1660 ;Start of the VBLANK routine
1670 ;
1680 MAIN
1690  LDA CRSINH       ;PEEK(752)
1700  BEQ ERASE        ;No PM cursor
1710  LDA SRTIMR       ;Key pressed?
1720  BEQ SKIP
1730  LDA #0           ;Yes, show cursor
1740  BEQ SKIP1        ;Forced branch
1750 SKIP
1760  LDA PFLASH       ;Flashing logic
1770  CLC
1780  ADC #PRATE
1790 SKIP1
1800  STA PFLASH
1810  BMI ERASE        ;Cursor invisible
1820  LDY #255         ;Clear the player
 RAM
1830  LDA #0
1840 LOOP1
1850  STA PLAYER2,Y
1860  DEY
1870  CPY #8
1880  BNE LOOP1
1890  LDA #PCOLOR      ;Init PM variable
s
1900  STA PCOLR2       ;Player 2 color
1910  STA COLPM2
1920  LDA #1
1930  STA GPRIOR
1940  STA PRIOR
1950  LDA #0
1960  STA SIZEP2
1970  LDA #PSTART/$100
1980  STA PMBASE
1990  LDA #2
2000  STA GRACTL
2010  LDA #2+32+8+16
2020  STA SDMCTL
2030  STA DMACTL
2040  LDX COLCRS       ;Check screen mod
e
2050  LDY ROWCRS
2060  LDA DINDEX
2070  ORA TINDEX
2080  BEQ SKIP2        ;Full screen
2090  LDA BOTSCR
2100  CMP #4
2110  BNE ERASE        ;No text window
2120  TYA              ;Add offset to li
ne
2130  CLC
2140  ADC #20
2150  TAY
2160 SKIP2
2170  TXA              ;Find hor. pos.
2180  ASL A
2190  ASL A
2200  ADC #48
2210  STA HPOSP2
2220  TYA              ;Find vert. pos.
2230  ASL A
2240  ASL A
2250  ASL A
2260  ADC #32+7
2270  TAY              ;Move cursor into
2280  LDX #7           ;position
2290 LOOP2
2300  LDA PSHAPE,X
2310  STA PLAYER2,Y
2320  DEY
2330  DEX
2340  BPL LOOP2
2350  JMP XITVBV       ;RETURN
2380 ;
2390 ERASE
2400  LDA #0           ;Move player
2410  STA HPOSP2       ;off screen
2420  JMP XITVBV
2430 ;
2440 ;Data for underline shape
2450 ;
2460 SHAPE
2470  .BYTE 0,0,0,0,0,0,0,240
```

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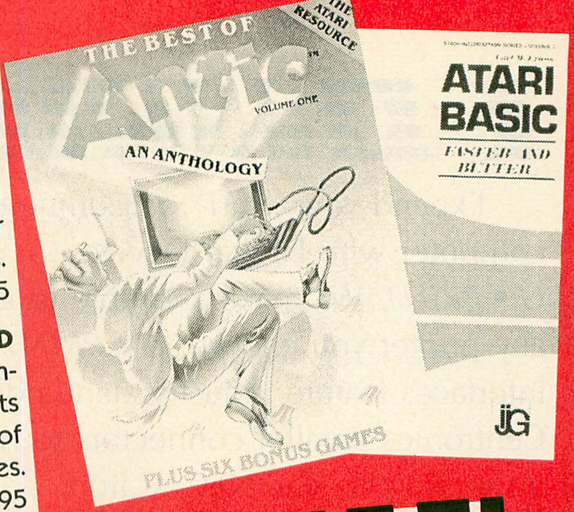
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WINDOWS

Your Atari delivers "The Latest Thing"

by JERRY WHITE and DAVE CULBERTSON

The latest buzzword in the computer world is "windows"—multiple on-screen display areas. This two-part series (to be concluded next month) shows you how to create these multiple display windows with your Atari. Listing 1, the BASIC demonstration program, runs on all Atari computers of any memory configuration. Listings 2 and 3, provided for your information, are Assembly Language source code for the machine language subroutines contained in DATA statements in Listing 1. You need not type these in to use Listing 1. Antic Disk subscribers RUN "D:WINDOWS.BAS".

A simple example of a text window is the bottom four lines of a Graphics 1 screen. If you set the left and right margins for maximum width (with POKE 82,0:POKE 83,39), this window is 40 characters wide by 4 lines long.

You can use the techniques in Listing 1 to define your own window size, and overlay the contents of any screen with any text you'd like to print. Once you've assigned your text to a string variable, it's a simple matter to swap the string's contents with a section of screen memory by invoking the two machine-language subroutines with the USR (User Sub-Routine) command. The text strings used in the BASIC demo program are A$, B$, and D$, and are assigned in lines 140 to 230. The two assembler routines appear in Listing 1 as DATA statements from lines 420 to 670.

Listing 2 contains the source code for the conversion subroutine, which is called in the BASIC demo in lines 250, 260, and 270. The screen display character values, or Internal Character Set, are the values for characters actually present in screen memory. Since ATASCII and screen display character values are not the same, this routine makes the required conversions. The BASIC demo program (Listing 1) stores the converter subroutine in the string C$. If we use DATA$ as the string containing the text to be displayed, the conversion from ATASCII to display characters is as direct as the command:

```
ASM=USR(ADR(C$),ADR(DATA$)).
```

Listing 3 is the source code for our Window display subroutine, which is stored in the string W$ in the BASIC demo. This routine is called using the command:

```
ASM=USR(ADR(W$),ADR(DATA$),
SOF,LIN,WID,LOF)
```

See lines 360 to 380 in the BASIC listing.

SOF is the offset distance of the window's top left corner in characters (the size of these units depend on the current Graphics mode) from the upper left corner of our screen. Using

continued on next page

Graphics 0, for example, SOF would be 40 if we want our window to be in the leftmost column of the second line from the top.

OPENING YOUR WINDOWS

LIN is the number of lines of text to be displayed, which determines the window's height. WID is the width of each line in characters, and LOF is the offset between the beginning of each successive line. If we want a rectangular window in GR.0, LOF would be 40. We could also have a slanted window by making LOF 39 or 41 (see Listing 1, lines 340 to 360). The BASIC demo program demonstrates rectangular as well as slanted windows.

When using these routines, you must be careful to follow a few simple rules. The last character in DATA$ *must* be a heart character. Type [CTRL][,] to enter the heart at the end of your data display strings. The only other rule is that you supply the proper number of legal parameters in your USR commands. Failure to follow either rule may cause your keyboard to lock up, so be sure to SAVE your programs *before* testing them.

Listing 1 demonstrates just a few ways it's possible to use windows. Let us know when you come up with something new you'd like to share. To help get you started, you might try defining your DATA$ as 960 characters (plus the heart) then flip an entire GR.0 screen from one display to another. You can use windows to overlay parts of your screen with warning or error messages. Using a redefined character set, you might also use windows to achieve animation.

*Jerry White is an institution in the world of Atari computing and a long-time **Antic** contributing editor.*

Dave Culbertson describes himself as a "computer person" who is well-versed in both hardware and software and who acts as a mediator between the two often-conflicting worlds. He's been active in microcomputing for nine years, and is vice president of Custom Electronics, Inc., which produces applications software for Atari and Apple computers.

product reviews

BANNERCATCH

Scholastic Software, Inc.
730 Broadway
New York, NY 10003
(212) 505-3000
$39.95, 48K—disk

Reviewed by Phil Seyer

Bannercatch is a five-level partnership game of strategy and skill. You and your partner compete on a 64-sector playing field against a character named Max. The object of the game is to capture Max's flag with your robots and carry it back to your part of the playing field. Your side has four joystick-controlled, "humanoid" robots. Max also has four robots.

The game is quite involved and comes with a number of items including a detailed instruction manual, a reference card, a secret document marked "for robots only," a colorful bannercatch poster, bannercatch stickers, and playing field map.

The playfield is huge. Only a portion of each of the 64-sectors of the playfield is visible on the screen at once. The screen is split so each partner can view a different part of the field. To keep track of your location, you have to note the sector number you're in and then refer to the playing field map.

Defeating Max and his robots isn't easy. To do it you have to work with your partner and learn how to intercept and decode the secret messages he sends to his robots. That's where an added bonus comes in. Max and his robots communicate in binary code. By playing the game you learn to read binary numbers, an important skill to have if you're interested in computer programming.

Besides defeating Max, another goal is revealing his mysterious face. Each time you win a game, a bit more of Max's face will appear. A special sheet is provided so you can gradually sketch in his face as you win more and more games.

Interesting sound effects occur when you accidentally bump into something or when you cross the river dividing the playing field. Lively, well-written music helps announce the winner of each game. The action can be quite exciting as you try to elude Max's robots or chase them when they steal your flag. Careful though! I almost broke a joystick running from Tor, one of Max's robots.

SIMULATED COMPUTER

Carousel Software, Inc.
877 Beacon St.
Boston, MA 02215
(617) 437-9419
$29.95, 32K—disk

Reviewed by Christine A. Lunardini

Have you ever wondered how a computer *really* works? **Simulated Computer** takes you step by step through the internal workings of your computer. The program is an excellent learning tool that encourages and rewards creativity.

Simulated Computer graphically illustrates the series of steps by which information is processed to produce a desired result. Across the top of the main screen is displayed a small keyboard with a set of hands which type in unison with your keystrokes. The keyboard is indirectly connected to the central processing unit (CPU), which is connected, in turn, to a printer. The remainder of the screen is devoted to three rows of boxes, six to a row, numbered for 00 to 23. These are the memory locations. The boxes include special locations for sound, graphic, and color definition.

Another strength of Simulated Computer is its documentation. Once you sit down at the computer, you are led through a series of hands-on tutorials that are clear, concise, and to the point. The tutorials are simple mathematical and Turtle Graphic exercises that get you right into the program. For example, as you work through the first tutorial, the computer hands at the top of the screen are typing right along with you. But you also see the invisible part of computing—where that series of instructions or data is stored internally, and what happens when you RUN your program.

TITLE BOUT

For the true boxing fanatic, **Title Bout** is a computerized simulation of the sport that lets you play manager to practically any boxer from recent history. The game includes data files for 509 real boxers from Muhammed Ali to Hilario Zapata (flyweight). Also, you can modify existing data files or create your own imaginary super pugilist.

Each boxer's file data profiles every aspect of his ring characteristics, from hitting power and ability to control the fight, to endurance and percentage of punches that actually connect. In all, the program evaluates 19 factors for each fighter in every round. Other factors included are the manager's strategy and fighter's attitude. If you play against the computer, you pick both fighters and the computer picks its strategy and fighter's attitude for each round. Otherwise, two human players make all decisions for themselves.

Each round is depicted graphically with animation and sound effects, but not in real time. The fighting seems to correspond fairly closely to each boxer's historic skills and whatever strategies you select. For realism, quotes like "You're meat" and "'Yo mama'', attributed to the current pugilists, appear periodically at the bottom of the screen. Muhammed Ali even does a little dance!

$30.00. Avalon Hill, 4517 Harford Road, Baltimore, MD 21214. Phone (301) 254-5300. Requires disk, 48K.

Information transfer is represented by electrical impulses that surge along circuits, through the CPU which assimilates each piece of information as it is called up and, in turn, sends its own message back to the memory locations. This process continues until all the information in the memory locations has been filtered through the CPU and the results are sent to the printer for output. If you are working with Turtle Graphics, the output will be a second screen which will display step-by-step the design you are creating.

Simulated Computer also teaches some basics of Assembler language. The tutorials are more directly responsible for the success of this aspect of the program. A series of programming "challenges" at the end of the tutorials, when successfully mastered, is a pleasantly surprising indication of how much you can learn about programming in a relatively short time. They are also positive reinforcement for creating your own programs to run through Simulated Computer.

All in all, Simulated Computer lives up to its promises and deserves the "Best Microcomputer Software Award" it received from *Learning Magazine*. An additional bonus is that the program can be rewarding for children under age 12 whose parents want to take the time to work through the tutorials with them, particularly the Turtle Graphics routines.

MEGAFONT II

If you have a dot matrix printer with graphics capability, **MegaFont II** will put it to good use. You can print in any of ten built-in custom fonts (character sets), or create your own fonts for use with the program. You can also dump Graphics 7 1/2 and Graphics 8 screens in three sizes. The instructions tell you how to convert compressed Micro Illustrator picture files for use with MegaFont.

If you use the standard font, even control and inverse characters are printed exactly as they appear on the screen. Among the other built-in fonts are two styles of script, various "fancy" fonts, italics, and Greek. You can print in two sizes. The large print is fairly light, and the other size is denser but too small. It would have been preferable to make the larger size a big denser.

MegaFont II is a revision of the earlier MegaFont. New features include the capability to type directly to the printer, changeable line spacing, faster operation and two new fonts. MegaFont II works with NEC, Prowriter, Epson (with Graftrax), and compatible printers. It works with Atariwriter, Bank Street Writer (mostly) and Text Wizard (if you print files to the disk), but is not compatible with Letter Perfect unless you have the LJK conversion utility.

$24.95, XLEnt Software, P.O. Box 5228, Dept A., Springfield, VA 22150. Phone (203) 644-8881. Requires disk, 48K.

BOULDER DASH

First Star Software
22 East 41st Street
New York, NY 10017
(212) 532-4666
$29.95, 32K—disk/cassette
$39.95, 16K—cartridge

Reviewed by Roger Fairchild

Boulder Dash is not only the name of this game, it is also a phrase you may be uttering often while you play. Your task in this scrolling maze game is to collect jewels with a beautifully animated character named Rockford. Pushing boulders out of the way to get to the elusive jewels, Rockford must watch out for falling boulders that shorten his quest. Once the required number of jewels are collected, a secret exit from each level will appear. Most of the time this exit isn't visible from your current location in the maze, and your search for the exit begins as time to complete the level quickly fades.

Rockford digs his way around much like Dig Dug, but the resemblance ends there. Boulder Dash offers much more variety, with 16 different caves and five levels of difficulty. Out to stop Rockford are Fireflys, Amoeba, Enchanted Walls and many other nasty characters.

Boulder Dash allows four different starting points evenly spaced throughout the levels. This feature allows you to see some of the higher levels that you would not have viewed otherwise. After every fourth level is a short puzzle that provides some interesting diversion.

Boulder Dash is a fast-paced, joystick-busting, arcade-style game that will keep you coming back time after time. The game is suitable on the beginning levels for children and on the higher levels will challenge a dedicated arcade addict. You'll get hours of enjoyment for your software bucks.

OPERATION WHIRLWIND

Broderbund
17 Paul Dr.
San Rafael, CA 94903
(415) 479-1170
$39.95, 48K—disk

Reviewed by Edward Bever

Tanks churn up a riverbank, with infantrymen darting and firing alongside. Behind them, an enemy hulk burns, while in front an officer looks on with a mixture of pride and preoccupation. Victory, according to the box cover, "will provide a decisive breakthrough in the war"; defeat could cause the collapse of the front.

Operation Whirlwind puts you in command of the tank and infantry battalion that must accomplish a criti-

continued on next page

cal mission. You must lead it across the country, surmount natural obstacles as well as enemy resistance, and seize and hold a town. The enemy, controlled by the computer, has prepared defenses and will undoubtedly receive reinforcements. Your skills as a strategist and tactician will be tested repeatedly as you struggle from one phase line to the next, and then turn to defend your conquest.

The game plays like a computerized boardgame, with each unit moved individually in sequence, and combat executed one attack at a time. The computer enhances this format by freeing the player from the need to memorize rules and keeping track of changes in the units' strengths during play. Furthermore, the computer keeps enemy pieces hidden until they fire, and it provides an opponent who is always willing to play.

The game's production values are very high. The documentation is clear and comprehensive. The graphics are first rate (except that on my copy some numerals come out garbled). The program is well structured, easy to operate with joystick or keyboard, and flawless in execution. It is easily learned, and it provides an absorbing challenge through four levels of difficulty.

SONGWRITER

Scarborough Systems, Inc.
25 North Broadway
Tarrytown, NY 10591
(914) 332-4545
$39.95, 48K—disk

Reviewed by Jerry White

Songwriter is designed for children or adults who wish to compose music on their computers and learn about music theory. The attractive package includes a diskette, a well-written 64-page manual, and a cable to connect Atari computers with a monitor or audio output line (800, 800XL, or 1200XL) to your home stereo or tape recorder.

Songwriter completely avoids the use of standard musical notation. The documentation explains as its reasons that: musical notation is not easily understood, it requires a prior knowledge of music and presents a distorted visual picture of music. While I agree with this, Songwriter is not much use to those who wish to learn how to enter songs from standard sheet music.

The Songwriter program and documentation are well written, and do have significant educational value. The main display simulates a "player piano roll," and option displays are neatly implemented. Computer keyboard options are logical, and include user definable keys for a sequence of keystrokes known as musical ideas. Songs and ideas can be easily edited, loaded, saved on diskette, combined, and printed.

Songwriter comes with 28 songs on disk, ranging from children's songs to classical music. Songs may be played normally, or one note at a time, forward, or backward. Speed and sound quality may be altered as the music is being played. Songwriter can store over 6,000 notes in memory, and has many other nice features too numerous to explain in a short review.

The only major drawback I found with the program is its inability to store and truly play more than one voice. While it is true that a long sustain may be used to create two sounds at the same time, this is the limit of Songwriter's multi-voice capability. But if you can live with this shortcoming, you will find Songwriter to be a useful musical composition tool, as well as a great way to introduce music to both young and old.

RELAX

Synapse
5221 Central Ave.
Richmond, CA 94804
(415) 527-7751
$139.95, 16K—disk & hardware

Reviewed by David Duberman

Relax is one of the most unusual products for the Atari ever! It's a biofeedback device that measures electrical activity in the forehead muscles. Potential uses for Relax range from no-hands computer game playing to applications control for handicapped people. You can also use Relax to monitor and possibly reduce stress in

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VIDEO BILLBOARD

Video Billboard makes it easy for you to create fancy text display sequences in multiple colors and different sizes of letters. It's a great tool for making title screens, in-store displays, breaking new ground in video poetry, etc.

You can fill the screen with as many as ten lines of thirty characters each, or as few as four lines of fifteen characters—depending on which of the three text sizes you pick.

You choose colors for text and background of each line. For special effects, you can have any lines flashing. You can automatically display a sequence of up to 20 screens from RAM, or up to 180 screens from disk.

The documentation is very clear and full of helpful hints. In addition, fifteen screens of on-line help are available at any time. Also, you can obtain printouts of your screens. If you have a need for an easy-to-use elaborate text display, this program is for you.

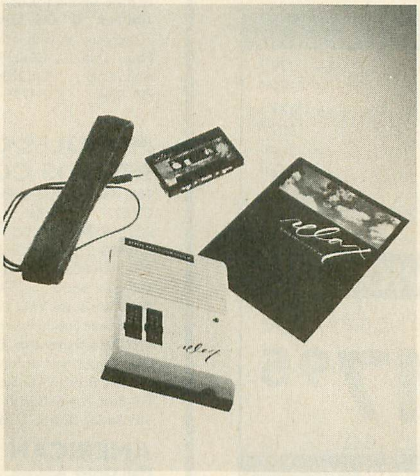
$69.95 from Ronald C. Tinnell, 2221 Windy Drive, Garland, TX 75042. Phone (214) 530-8135 between 6–10 P.M. CST. Requires disk, 48K.

your life.

The measurement of electrical muscle activity is called electromyography. When the muscle is tensed, electrical activity increases. Sensors in the Relax headband pick up these tiny signals and send them through an amplifier box to the computer. Synapse software interprets the signals so you can easily see changes in your muscle tension.

The blue corduroy headband contains three disk-like metal sensors. It fastens with Velcro and plugs into the main unit with an eight-foot cord.

The Electromyograph unit connects to joystick Port 1 on an Atari computer. There is an on/off switch with a power LED, and two sliding controls for adjusting the unit's sensitivity. Since the unit (and you) are electrically isolated from the Atari's AC power supply for safety, four AA batteries (alkalines are suggested) are required. The unit drains power constantly whether in use or not, so you should be careful to turn it off when you're through. The LED lights up even when battery power is low, so the best indication of dead batteries is lack of response when using the Relax program.



The first program on the disk, a simple moving graph, is intended for use with the audio cassette. The 25-minute narration consists of suggestions for relaxation, spoken in an ultra-calm voice. Accompanying sounds imply various soothing environments, such as forests and beaches.

Part of the narration ties in with the graph program's display, which shows a vertically oscillating point drawing a trace on a sheet of horizontally moving "paper," much like a lie detector

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THE INSTITUTE

The Institute was released in very limited quantities several years ago in a text-only version. Shortly thereafter, work began on this high-resolution graphics version.

This deviously clever game places you in a mental asylum, from which you can only escape in your dreams. When you "solve" one dream, you return to The Institute to solve another. Commands are typical for such games, including compass directions N, E, S, W, NE, etc. Many of the puzzles are extremely challenging (the solutions may strike you as illogical), so there are 22 encrypted hints included in the instructions.

One of The Institute's best features is its graphics. The cartoon-like drawing style is cute and fun to look at. There are over 60 different colorful high-resolution graphics screens, some of which contain important visual clues that aren't mentioned in the text. If you're moving through a familiar area, you can turn off the graphics for a faster journey. For a real challenge in adventure gaming, try The Institute.

$29.95. Screenplay, Box 3558, Chapel Hill, NC 27514. Phone (919) 968-0051. Requires disk, 48K.

product reviews

The vertical "relaxation scale" ranges from 0 to 500, of which you can see 150 points at a time. You start at the top end of the scale (350–500), and use the sliding controls to adjust your trace to the arbitrary beginning point of 450.

When your trace reaches the bottom of the visible part of the scale, you must momentarily stop and switch to the lower range. I've found it surprisingly easy to get below 350, but it takes practice to progress from there. If you have difficulty obtaining a smooth trace, there are keyboard command adjustments to average out the readings and to take fewer readings per unit of time.

The second program, Kaleidoscope, provides a beautiful visual relaxation aid as it measures your relative relaxation. As you relax, colorful changing patterns split horizontally and scroll up and down while more appear. If you tense up, the process reverses.

The third program, Balloon Game, is a colorful Frogger-type game that rewards not only the ability to relax but also the ability to switch quickly back and forth between states of tenseness and relaxation. Your "trace" is replaced by a balloon floating up and down in back-and-forth cross-currents which carry "good" bubbles (catch them) and "bad" spikes (avoid them).

Balloon Game suggests interesting possibilities for Relax, particularly for the handicapped. Those who are without the use of their limbs may be able to use it for sophisticated control of complex programs.

The Relax workbook, which wasn't ready at review time, will supplement Relax programs with exercises and suggestions for using the system effectively.

Relax provides a valuable service by giving us visible feedback on the state of tension in our muscles, but it's up

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to us what we do with that information. However, the new availability of bio-feedback programs for the home computer opens up many fascinating possibilities.

MONTEZUMA'S REVENGE

Parker Brothers
50 Dunham Rd.
Beverly, MA 01915
(617) 927-7600
approx. $30, 48K—disk

Reviewed by David Duberman

Parker Brothers' latest arcade conversion, **Montezuma's Revenge** is a graphic action game *par excellence*. It's now available for Atari computers on XL-compatible 48K disk.

You're Panama Joe, an explorer lost in the depths of the Mexican emperor's fortress. The countless rooms of the fortress may each contain jewels, weapons, and other valuable objects. The rooms also hold enemies that you jump over or duck—rolling or bouncing skulls and crawling spiders, plus non-moving snakes.

The variety of rooms seems almost endless. Many rooms contain moving surfaces that dump you unceremoniously into flaming lava pits if you're not agile, causing you to disappear in a puff of smoke. There are ladders for moving vertically and chains for climbing or jumping about. And watch out for the laser gates!

Rooms contain objects that you must pick up in order to progress through the game. Most important are keys, which come in three colors. If you encounter a door without possessing the proper color key, you cannot pass. Pick up jewels for extra points. Earning lots of points gives you extra lives. Possession of a sword lets you vanquish the next enemy you touch, whereupon you lose the sword. If you find a hammer, you're invulnerable to skulls and spiders for the next five seconds or so.

There's only one (extremely inaccessible) torch at each play level, but you must get it in order to explore the lower depths. The rooms here are dark, and it is possible to explore them without a light, but very risky.

You'll know when you reach the emperor's treasure room, the final room in each level of play. The room is filled with chains and jewels and glows with an eerie light. The only ways to move about are by jumping or climbing from chain to chain.

You can start at any of the first three of the nine levels of play. Each higher level features more and faster enemies, and more dark rooms. If you lose while playing on the first level, you're allowed to start the next game in the same room in which you died—once only.

The variety of rooms seems almost endless.

The next time you die, you must start over from the beginning. This can be frustrating if you keep getting killed just before you finish a level. It would be good to have the save game option that's standard on most text adventure and fantasy role-playing games. One nice feature eliminates time limits from the game, allowing you to work out a strategy for getting through a room without pressure.

CITYWRITER

CityWriter is a word processing program aimed at beginning computer users. All commands are immediately accessible via Atari's special keys—Option, Select, and Start. The list of currently available commands always appears in a window at the bottom of the screen. At the start of the program, you can simply press [START] and begin to type in Enter mode.

Edit mode lets you move through the document by character, by line, or by page, search and replace, and type over existing text. Unfortunately, to insert a passage you must type it at the end of the document and then use the text move function to place it correctly.

From the File sub-menu, you can see the disk directory, load a file either by adding it to or replacing text currently in memory, save, erase or rename a file, and format a disk. Finally, Print mode lets you format your hard copy, including page width and length, margin width, beginning page number at top or bottom, single or double-spaced, and right justification. There are no built-in printer control functions for underlining, boldface, etc. However, you get instructions for creating a printer control disk file that lets you use these features if your printer has them.

One major criticism is that the Atari keyclick isn't disabled. This sound can be quite annoying to those in the typist's immediate surroundings. Also there isn't much room for text—only six pages can be held at one time in a 48K Atari's RAM. For beginners, though, this program will probably satisfy most needs.

$39.95 from Software City, Dept. A, 1415 Queen Anne Road, Teaneck, NJ 07666. Phone toll-free 1-800-421-5300 Ext. R264 or (201) 833-8510.

new products

GUMBALL

(game)
Broderbund Software
17 Paul Dr.
San Rafael, CA 94903
(415) 479-1170
48K — disk
$29.95

This new action arcade game places you in the Sticky Sole Gumball Factory where you must sort gumballs while avoiding the antics of your zealous supervisor. The game includes quotas, possibilities for promotion and a colorful cartoon.

SCREENSHOOTER

(hardware)
NPC PHoto Division
1238 Chestnut St.
Newton Upper Falls, MA 02164
(617) 969-3487
$169.00



The Screenshooter system gives you a simple way to take photographs of your video display. It includes a hood that fits over your monitor, special lenses, a Polaroid One Step 600 camera with bracket, and second bracket that holds 35mm SLR cameras.

CRITICAL CONNECTION XL VERSION

(Atari-to-CP/M interface)
USS Enterprises
6708 Landerwood Lane
San Jose, CA 95120
(408) 997-0264
$175

This 15-foot cable and software package connects the serial port of popular CP/M machines to the Atari disk/printer port. According to preliminary information, an Atari XL computer can be used with the disk drives, printer and keyboard of a system running CP/M.

Return the favor. When you call a manufacturer or supplier about a product you've seen advertised or otherwise mentioned in ANTIC, please tell them so. This will help us to continue to bring you the latest information about products that will make your Atari computer an even more valuable investment in the future. —ANTIC ED

THE DOLPHIN'S PEARL MIDDLE OF THE ROAD LIZARD DAY

(software)
Reston Computer Group
11480 Sunset Hills Rd.
Reston, VA 22090
(800) 336-0338
Each game: 48K — disk and joystick
$29.95

Each game puts you in the role of a creature (dolphin, lizard or player drifting above the earth) who must face increasing levels of obstacles at stages of life. There are goals in each game, as well as lessons and insights. For instance, in the Dolphin's Pearl you start as a dolphin who must learn to swim, leap, and explore the unseen with sound. Eventually, you attempt to find the secret place that holds the Dolphin's Pearl, while avoiding hunters, harpoons, and deadly sea creatures.

THE INCREDIBLE LABORATORY

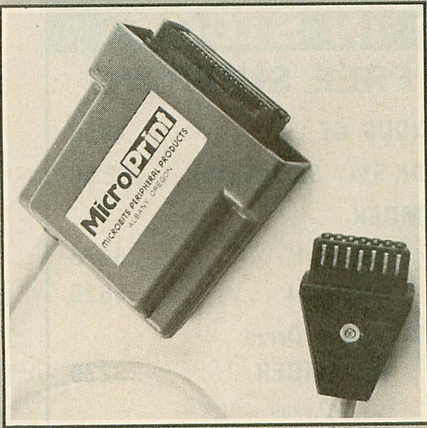
(education)
Sunburst Communications Inc.
39 Washington Ave.
Pleasantville, NY 10570
(914) 769-5030
48K — disk
$39.95

A problem-solving program for ages 11 and up, The Incredible Laboratory requires kids to use trial and error and note-taking to discover how chemicals combine to create colorful and unusual monsters, according to the manufacturers.

MICROPRINT

(hardware)
Microbits Peripheral Products
225 Third Ave., SW
Albany, OR 97321
(503) 967-9075
$79.95

MPP claims the MicroPrint, a printer interface for all Atari computers, replaces the 850 interface. It comes with a two year warranty and a four-foot cable with Centronics plug. MicroPrint should be compatible with Epson, NEC, and Prowriter, among other printers.



XL BOSS V1.0

(operating system)
Allen Macroware
P.O. Box 2205
Redondo Beach, CA 90278
(213) 376-4105
800/600XL Version — $79.95
1200XL Version — $89.95

The XL Boss is claimed to be a replacement operating system for Atari XL computers, offering built-in BASIC with a key stroke, access to 4K of extra RAM, pushbutton coldstarts, and instant compatibility (without the Translator disk) with programs such as Letter Perfect, File Manager 800+, Text Wizard and many games not previously compatible with the XL line.

New Products notices are compiled by the **Antic** staff from information provided by the products' manufacturers. Antic welcomes such submissions, but assumes no responsibility for the accuracy of these notices or the performance of the products listed.

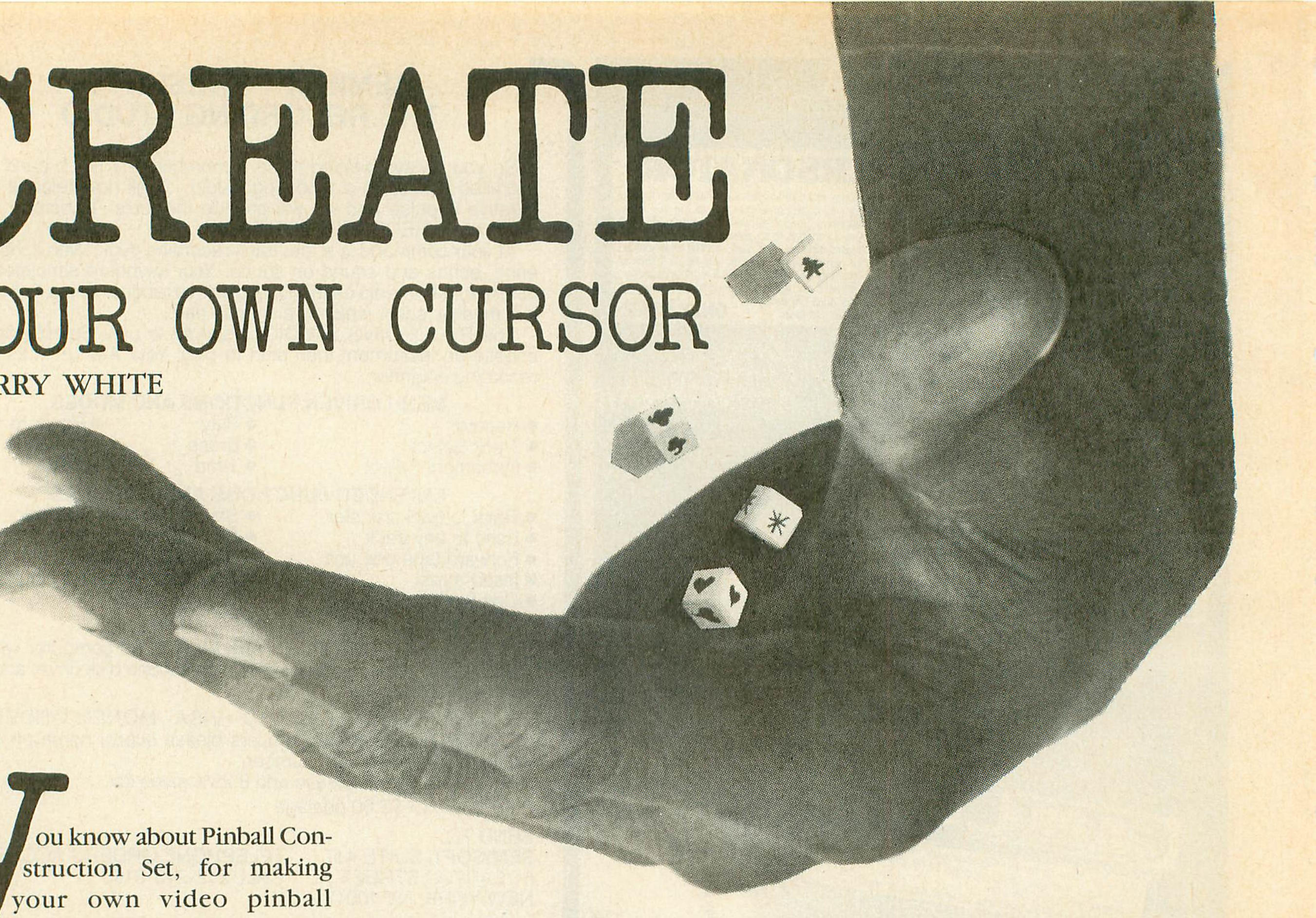
SHOPPER'S GUIDE

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CREATE YOUR OWN CURSOR

by JERRY WHITE



You know about Pinball Construction Set, for making your own video pinball games, and Music Construction Set, for composing complete musical pieces with minimum hassle. Welcome to Cursor Construction Set! If you're tired of looking at a square white unblinking cursor, this program is for you.

Type in Listing 1. Check it with TYPO and SAVE a copy.

When you RUN the BASIC program, you're first asked for the cursor flash rate, from 1 to 64. The higher the number, the faster the rate. For starters, try 16.

You're then prompted to enter a cursor color number from 0 to 255. (Your Atari BASIC manual has a chart of the color numbers.) For a bright yellow cursor, try 28. Be careful not to use the background color, or the cursor won't be visible.

When you've entered these two values, the cursor appears and the program ends. You may then LIST and tinker with the program, or issue a NEW command and use your custom cursor on another program. You can even keep your custom cursor when you change graphics modes. To return to the standard Atari cursor, POKE 752,0, and to use our custom cursor, POKE 752,1. The only drawback is that you can't use other Player/Missile Graphics while using the custom cursor. To completely disable the custom cursor routine, press [RESET].

At last . . . you can create a cursor in any color, shape, and blink rate you choose. This short BASIC program works on all Atari computers. Antic Disk subscribers, RUN "D:PMCURSOR.BAS".

HOW IT WORKS

This program uses Atari's Player/Missile Graphics capability to set up a "player" as the cursor.

Line 630 contains the data that sets the cursor's shape. As written, the cursor is a thin underline. You modify the shape by changing the data in this line. Listing 2 contains the assembly language source code for the machine language "vertical blank" routine used in Listing 1. You need not enter Listing 2.

Although the machine language routine contained in Listing 1 is relocatable to other memory addresses, it's usually best not to store it as part of a string. When you use the immediate mode, BASIC may move the location of a string in RAM. But the vertical blank routine must remain at a fixed address. So if you need to use immediate mode, keep the routine in a fixed location. This BASIC demo finds a safe location by subtracting 33 pages from RAMTOP (the top of available memory) to insure that the 181-byte routine is stored well below the display list and the screen memory for any graphics mode. If you use only Graphics 0, you could change the 33 in line 350 to 6, leaving more room for your BASIC program.

The program uses Player/Missile Graphics in single-line resolution to create the cursor. The cursor is Player Two, and its data is stored in Page Six, to avoid reserving an additional chunk of RAM for Player/Missile memory.

***Antic** Contributing Editor Jerry White is co-author of "Windows" which appears elsewhere in this issue. We rushed this piece into print to answer 11-year-old Brian Woodruff's August I/O letter which generated a great deal of reader response.*

listing continued on page 68

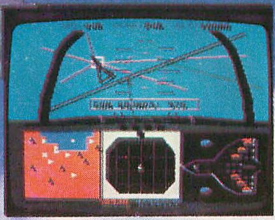
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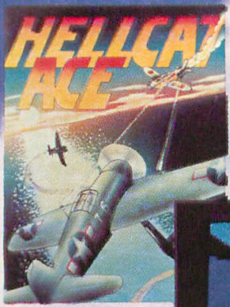
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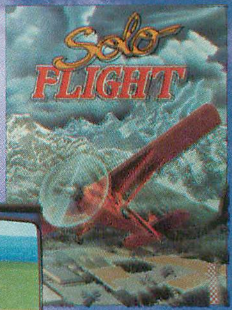


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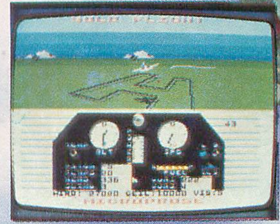


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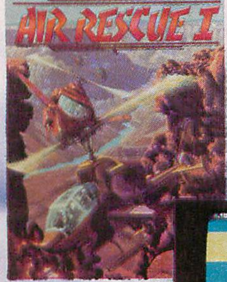
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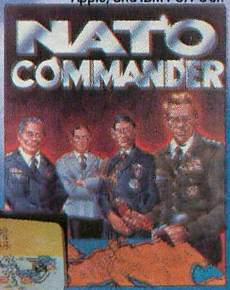




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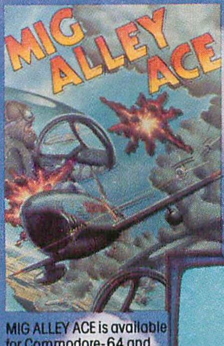
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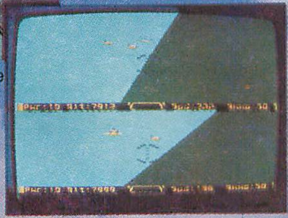
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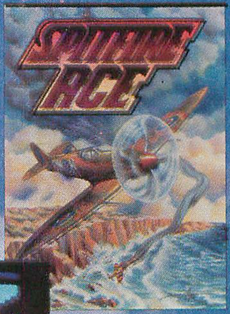


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